



JAPAN RADIO TEST REPORT

Prepared For : Fuzhou Chaoyu E-Commerce Co., Ltd
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Gulou District, Fuzhou City, Fujian Province
Manufacturer : Fuzhou Chaoyu E-Commerce Co., Ltd
Address : Room 02, 18th Floor, Aviation Building, No. 123 East Street,
Gulou District, Fuzhou City, Fujian Province
E.U.T : Projector
Trade Name : Clovioet
Model No. : R100, B0GHFFZVH2, B0GGHNVPHR, B0GHFG5ZFP,
B0GHF9GWQ5
Prepared by : Centre testing Commodity Co., LTD.
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Standards : MIC Notice No.88 Appendix No. 43
Article2 Paragraph 1, item 19
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Test Engineer : King Wang

Manager : Raymon Yu



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Centre testing Commodity Co., LTD.



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1. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

1.1. EUT DESCRIPTION

Product Designation:	Projector
Model Name:	R100
Series Model:	B0GHFFZVH2, B0GGHNVPHR, B0GHFG5ZFP, B0GHF9GWQ5
Model Difference:	These product are same PCB Layout, Schematics, BOM. Only the difference in model Name.
Bit Rate of Transmitter:	1M, 2M, 3M
Modulation Type:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Operation Frequency:	2402 ~ 2480MHz for EDR+BR
Antenna Designation:	Chip Antenna (Antenna Gain: 2.95 dBi)
Channel No.:	79 Channels for EDR+BR
Power Rating:	AC 100-240V, 50/60Hz
Chip Power Rating:	DC 3.3V
Hardware Version:	V1.0
Software Version:	V1.0

Note:

1. Only the BT was tested according the standard requirement.
2. CH00 ~ CH78 are Operating within 2402~2480MHz.
3. Please refer to Appendix I for the photographs of the EUT. For more details, please refer to the User's manual of the EUT.

**1.2. CHANNEL LIST**

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2402	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2480
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		



1.3. TEST CONDITIONS

The BT module was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Voltage Fluctuation Test		Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
AC Power		AC 100	AC 110V	AC 90V
Module Voltage		DC 3.301V	DC 3.306V	DC 3.293V
Voltage error(%)	Result	Ref.level	0.1515	-0.2424

Note:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

Temperature:	24.2℃	Humidity:	51%RH
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1.4. DESCRIPTION OF TEST MODES

To Projector the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	GFSK
Mode 2	π/4-DQPSK
Mode 3	8DPSK

Test Channel	Description
Mode 1	2402MHz (CH00)
Mode 2	2441MHz (CH39)
Mode 3	2480MHz (CH78)



2. SUMMARY OF TEST RESULTS

2.1. TEST PROCEDURES ACCORDING TO THE TECHNICAL STANDARDS:

Part	Description of Test	Result
3.2(2)	Antenna Power	Pass
3.2(3)	Tolerances for Antenna Power	Pass
3.2(4)	Frequency Tolerance	Pass
3.2(7)	Occupied Bandwidth	Pass
3.2(8)	Spread Bandwidth	Pass
3.2(9)	Spreading factor	Pass
3.2(10)	Number of Carriers	N/A
3.2(11)	Dwell Time	Pass
3.2(6)	Spurious Emissions	Pass
/	Interference prevention function	Pass
/	Carrie Sensing function	N/A
3.2(1)	Secondary Radiated Emissions	Pass

Note 1: MIC Notice No.88 Appendix No.43

Note 2: MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20.

Note 3: "N/A" denotes test is not applicable in this Test Report.

2.2. TEST FACILITY

Centre testing Commodity Co., LTD.

Address: Room 501, Yuanshuo Science Park Factory Building, No.8 South Lane, Xinshiqiao Street, Guihua Community, Longhua District, Shenzhen.

Web: www.ctc-labs.com

Mail: info@ctc-labs.com

2.3. MEASUREMENT UNCERTAINT

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) $K=1.96$ or $K=2$ (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal).

Parameter	Uncertainty
RF frequency	$\pm 6 \times 10^{-7}$ MHz
Total RF power, conducted	± 0.8 dB
Spurious emissions, conducted	± 0.8 dB
DC and low frequency voltages	$\pm 3\%$ V
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$



3. DETAILS OF TEST

3.1. LIST OF TEST EQUIPMENTS

Kind of Equipment	Manufacturer	Type	S/N	Last calibration	Calibrate until
Wideband radio communication tester	R&S	CMW500	116483	2025-04-29	2026-04-28
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2025-04-29	2026-04-28
EXA Signal Analyzer	Keysight	N9010A	MY54488841	2025-04-29	2026-04-28
MXG Vector Signal Generator	Agilent	N5182A	MY49060701	2025-04-29	2026-04-28
MXG Analog Signal Generator	Agilent	N5181A	MY50143107	2025-04-29	2026-04-28
RF control unit	Techy	TR1029-1	21C8060397	2025-04-29	2026-04-28
DC Power supply	Agilent	E3632A	MY50120052	2025-04-29	2026-04-28
Oscilloscope	Siglent	SDS1202X-E	SDSEBBQ1R5533	2025-04-08	2026-04-07
Power Meter	Agilent	E4419B	230480	2025-04-29	2026-04-28

Note: 1. Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law.

2. Calibration Laboratory: Guangzhou Lisai Metrology & Test Co., Ltd

3. ☐ (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act.

☐ (b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act.

☒ (c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act.

☐ (d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above.

3.2. DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Brand	Model/Type No.	Series No.	Note
1	Projector	Clovioet	R100	N/A	EUT
2	PC	Lenovo	510Pro-14IMB	N/A	AE

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



4. TEST RESULTS

4.1. FREQUENCY ERROR MEASUREMENT

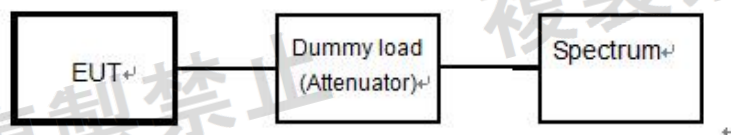
4.1.1. LIMIT

Item	Limits
Frequency Tolerance (2402~2483.5MHz)	$\leq \pm 50\text{ppm}$

4.1.2. TEST PROCEDURES

1. Frequency accuracy of SA shall be less than 10% of limits tolerance (5ppm)
2. Setting of SA is following as: RB:10kHz / VB:10kHz / SPAN: 1MHz
AT: 10dB / Ref: 0dBm
3. Center Frequency: The center frequency of testing for EUT
4. Sweep time: Auto
5. Sweep mode: Continuous sweep
6. Detect mode: Positive peak
7. Mark function: Frequency Counter (Resolution 100Hz)
8. EUT have transmitted absence of modulation signal and fixed channelize. f is using the mark cursor to mark the peak frequency value, fc is declaring of channel frequency.
Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than $\pm 50\text{ppm}$

4.1.3. TEST SETUP LAYOUT



4.1.4. TEST DEVIATION

There is no deviation with the original standard.

4.1.5. EUT OPERATION DURING TEST

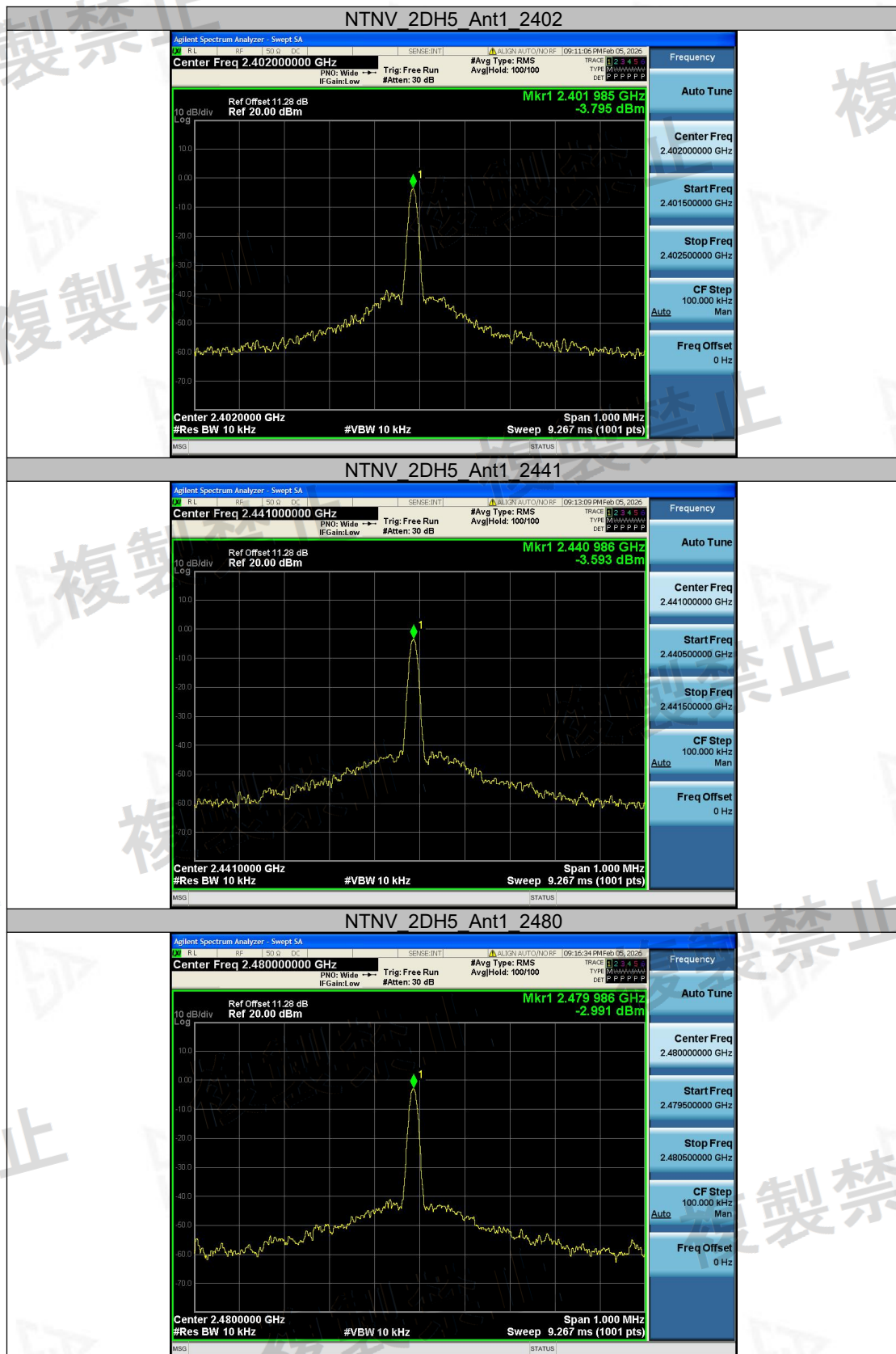
The EUT was placed on the test table and programmed in un-modulation function.

4.1.6. RESULTS OF FREQUENCY ERROR

Normal Voltage				
Modulation	Channel	Result[ppm]	Limit[ppm]	Verdict
$\pi/4$ -DQPSK	2402	-6.24	± 50	Pass
	2441	-5.74	± 50	Pass
	2480	-5.65	± 50	Pass

Note: 1. Only the data plot of the worst test data is recorded.

2. All the modes have tested and recorded the worst mode in the report.





4.2. OCCUPIED BANDWIDTH AND SPREAD-SPECTRUM BANDWIDTH MEASUREMENT

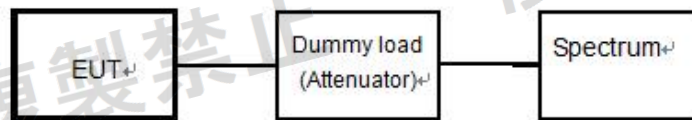
4.2.1. LIMIT

Item	Limits
Occupied Bandwidth:	FH $\leq$ 83.5MHz; OFDM, DS $\leq$ 26MHz, OFDM within 26-40MHz; Others $\leq$ 26MHz
Spreading Bandwidth:	$\geq$ 500 kHz (FH, DS)

4.2.2. TEST PROCEDURES

- Occupied Bandwidth: Setting of SA is following as: RB: 1M / VB: 1M / SPAN: 83.5MHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
Spreading Bandwidth: Setting of SA is following as: RB: 0.3M / VB: 0.3M / SPAN: 83.5MHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping (For FHSS Device).
SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
- SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
- Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
- Spread Spectrum Factor limit is greater than 5

4.2.3. TEST SETUP LAYOUT



4.2.4. TEST DEVIATION

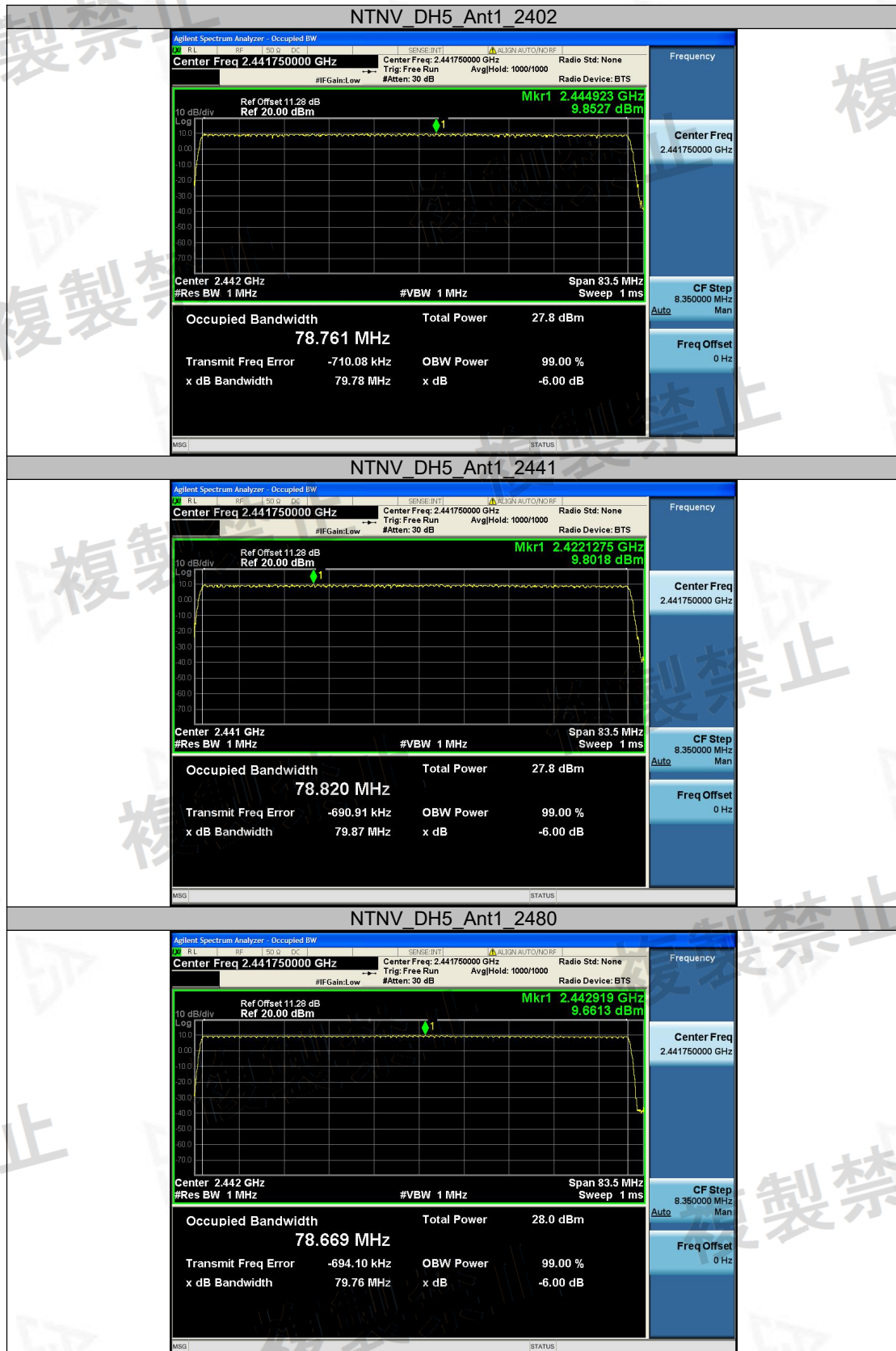
There is no deviation with the original standard.

4.2.5. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmittin Mode.

4.2.6. RESULTS OF OCCUPIED BANDWIDTH AND SPREAD-SPECTRUM BANDWIDTH

Normal Voltage					
Modulation	Mode	99% Occupied Bandwidth (MHz)		Limit (MHz)	Result
GFSK	Hopping	78.761		83.5	Pass
$\pi/4$ -DQPSK	Hopping	78.820		83.5	Pass
8DPSK	Hopping	78.669		83.5	Pass
Modulation	Frequency (MHz)	90% Spread Bandwidth (MHz)	Spread Factor	Limit (MHz)	Result
GFSK	Hopping	70.364	70.364	>0.5	Pass
$\pi/4$ -DQPSK	Hopping	70.987	35.50	>0.5	Pass
8DPSK	Hopping	70.828	23.61	>0.5	Pass







4.3. UNWANTED EMISSION INTENSITY MEASUREMENT

4.3.1 LIMIT

Item	Limits
TX Spurious Emission(2402~2483.5MHz)	$\leq 0.25 \mu\text{W}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

4.3.2. MEASURING INSTRUMENTS AND SETTING

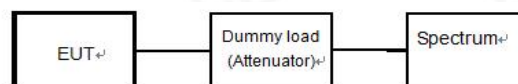
Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. TEST PROCEDURES

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: Below 1GHz RB:100KHz / VB:100KHz
Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak Trace mode: Max hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 0.25 μW .
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25 μW
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW
8. Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30kHz, Result_Value = Measured_Value + 15.2 [dBm]
9. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

4.3.4. TEST SETUP LAYOUT



4.3.5. TEST DEVIATION

There is no deviation with the original standard.

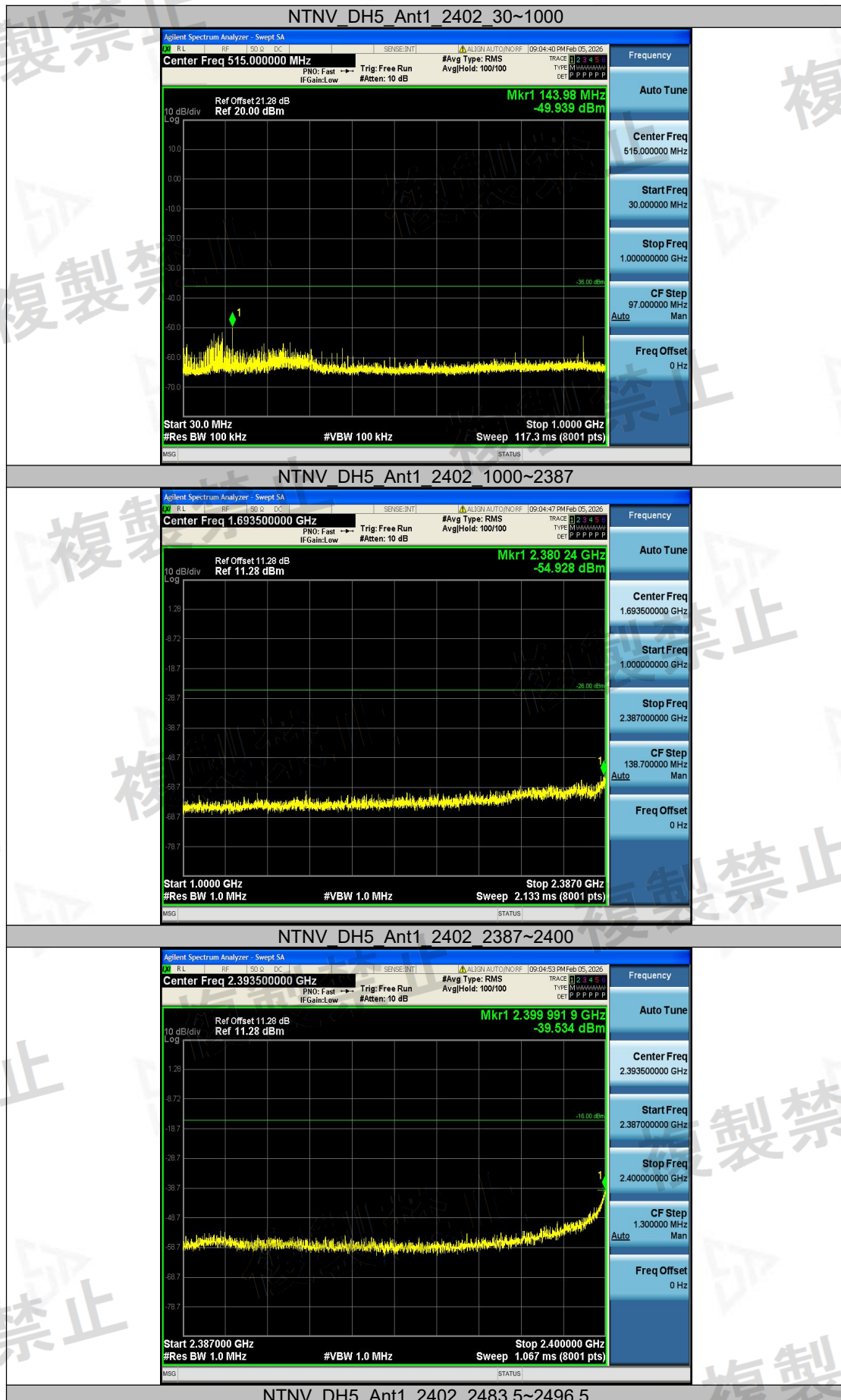
4.3.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmittin mode.

4.3.7. TEST RESULT OF UNWANTED EMISSION INTENSITY

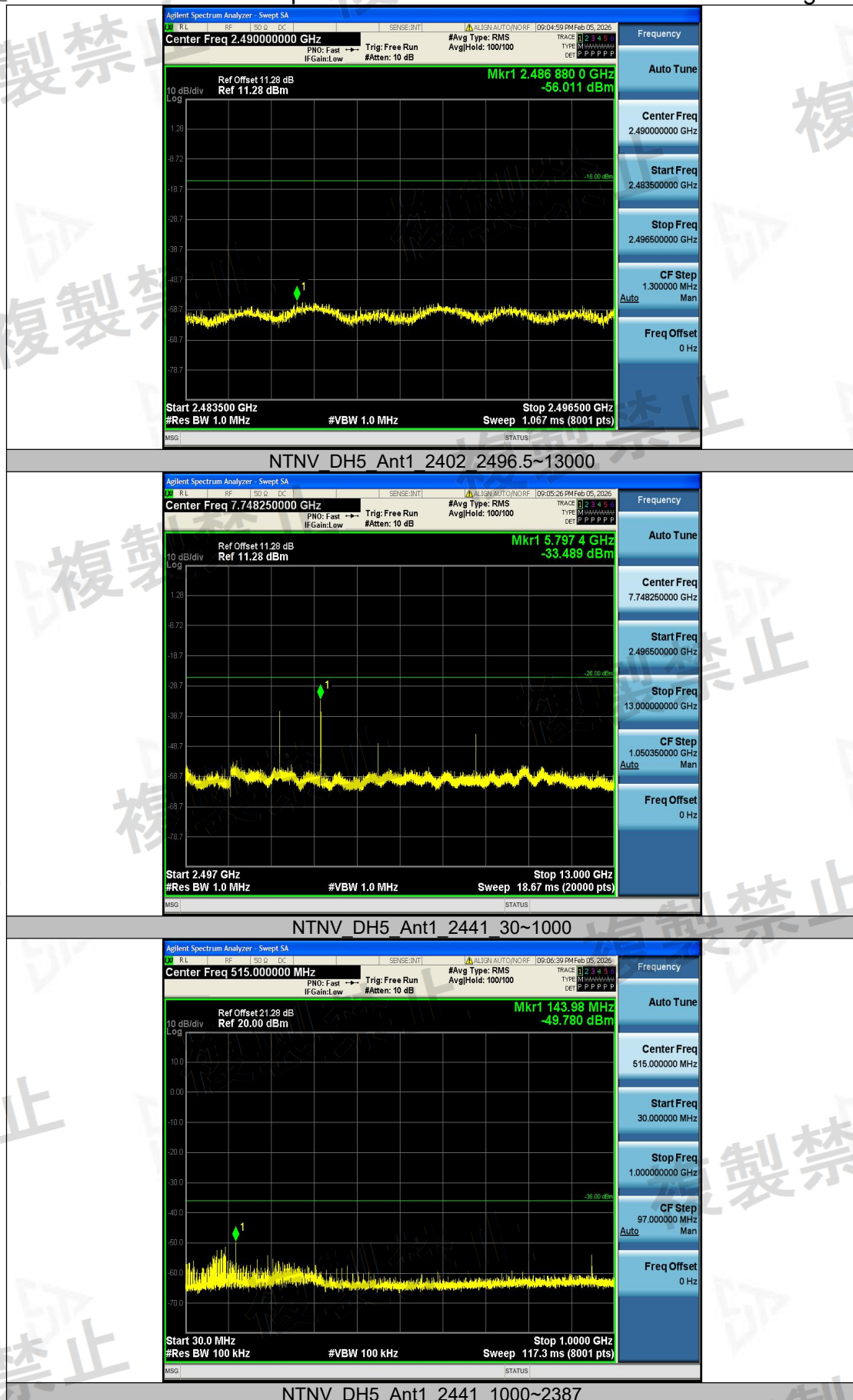


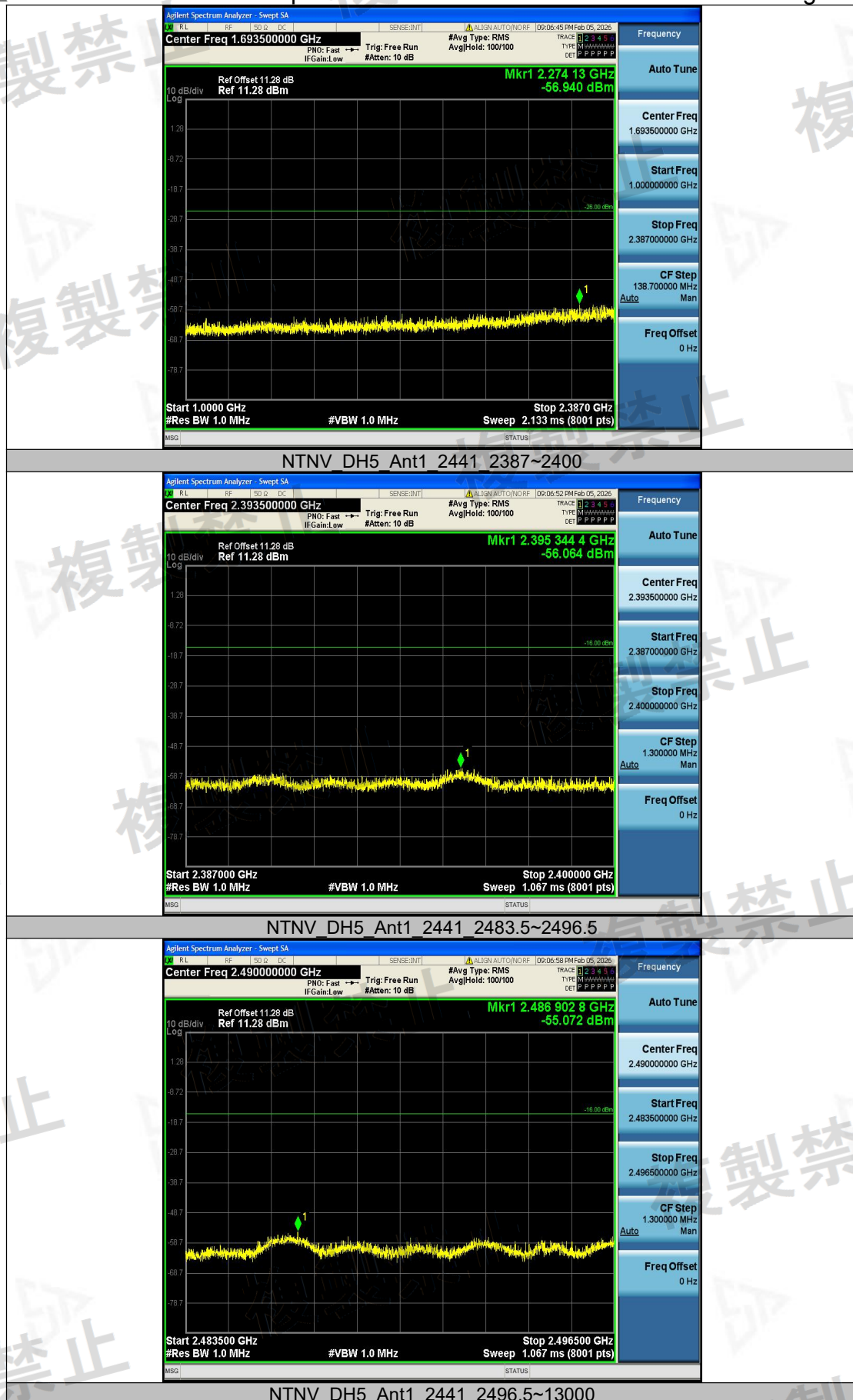
Test Condition	Test Mode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	-49.94	≤-36	0.01014	≤0.3	PASS
				1000~2387	-54.93	≤-26	0.00321	≤2.5	PASS
				2387~2400	-39.53	≤-16	0.11143	≤25	PASS
				2483.5~2496.5	-56.01	≤-16	0.00251	≤25	PASS
				2496.5~13000	-33.49	≤-26	0.44771	≤2.5	PASS
			2441	30~1000	-49.78	≤-36	0.01052	≤0.3	PASS
				1000~2387	-56.94	≤-26	0.00202	≤2.5	PASS
				2387~2400	-56.06	≤-16	0.00248	≤25	PASS
				2483.5~2496.5	-55.07	≤-16	0.00311	≤25	PASS
				2496.5~13000	-35.01	≤-26	0.31550	≤2.5	PASS
			2480	30~1000	-49.97	≤-36	0.01007	≤0.3	PASS
				1000~2387	-56.27	≤-26	0.00236	≤2.5	PASS
				2387~2400	-55.99	≤-16	0.00252	≤25	PASS
				2483.5~2496.5	-50.13	≤-16	0.00971	≤25	PASS
				2496.5~13000	-38.27	≤-26	0.14894	≤2.5	PASS
	2DH5	Ant1	2402	30~1000	-49.36	≤-36	0.01159	≤0.3	PASS
				1000~2387	-55.89	≤-26	0.00258	≤2.5	PASS
				2387~2400	-32.70	≤-16	0.53703	≤25	PASS
				2483.5~2496.5	-57.08	≤-16	0.00196	≤25	PASS
				2496.5~13000	-38.82	≤-26	0.13122	≤2.5	PASS
			2441	30~1000	-50.07	≤-36	0.00984	≤0.3	PASS
				1000~2387	-57.85	≤-26	0.00164	≤2.5	PASS
				2387~2400	-57.12	≤-16	0.00194	≤25	PASS
				2483.5~2496.5	-56.48	≤-16	0.00225	≤25	PASS
				2496.5~13000	-39.07	≤-26	0.12388	≤2.5	PASS
			2480	30~1000	-50.11	≤-36	0.00975	≤0.3	PASS
				1000~2387	-56.61	≤-26	0.00218	≤2.5	PASS
				2387~2400	-56.87	≤-16	0.00206	≤25	PASS
				2483.5~2496.5	-50.75	≤-16	0.00841	≤25	PASS
				2496.5~13000	-34.50	≤-26	0.35481	≤2.5	PASS
	3DH5	Ant1	2402	30~1000	-50.29	≤-36	0.00935	≤0.3	PASS
				1000~2387	-55.35	≤-26	0.00292	≤2.5	PASS
				2387~2400	-31.35	≤-16	0.73282	≤25	PASS
				2483.5~2496.5	-56.29	≤-16	0.00235	≤25	PASS
				2496.5~13000	-38.11	≤-26	0.15453	≤2.5	PASS
			2441	30~1000	-49.77	≤-36	0.01054	≤0.3	PASS
				1000~2387	-56.05	≤-26	0.00248	≤2.5	PASS
				2387~2400	-56.96	≤-16	0.00201	≤25	PASS
				2483.5~2496.5	-56.45	≤-16	0.00226	≤25	PASS
				2496.5~13000	-34.70	≤-26	0.33884	≤2.5	PASS
			2480	30~1000	-50.26	≤-36	0.00942	≤0.3	PASS
				1000~2387	-57.15	≤-26	0.00193	≤2.5	PASS
				2387~2400	-56.70	≤-16	0.00214	≤25	PASS
				2483.5~2496.5	-52.05	≤-16	0.00624	≤25	PASS
				2496.5~13000	-41.71	≤-26	0.06745	≤2.5	PASS

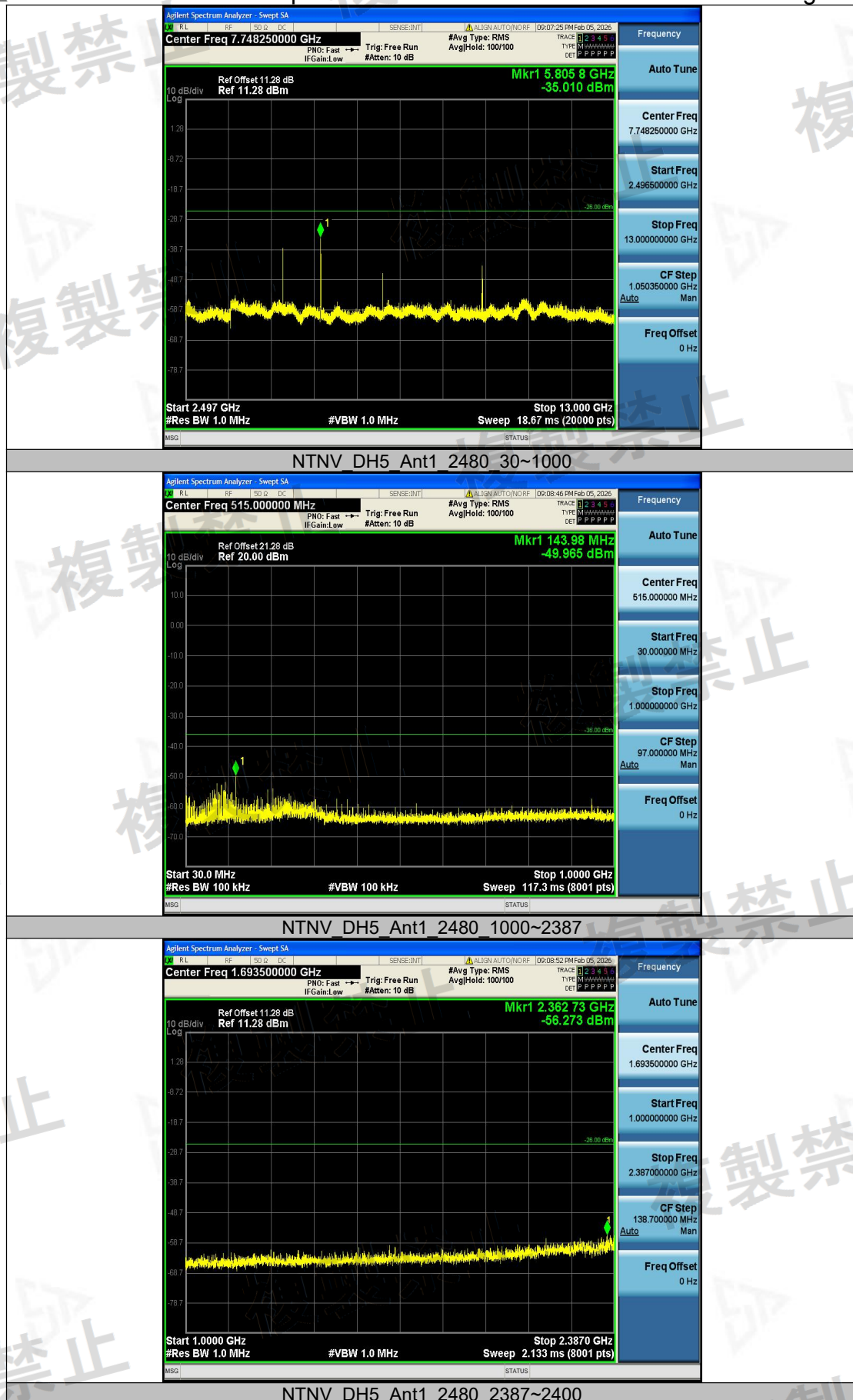


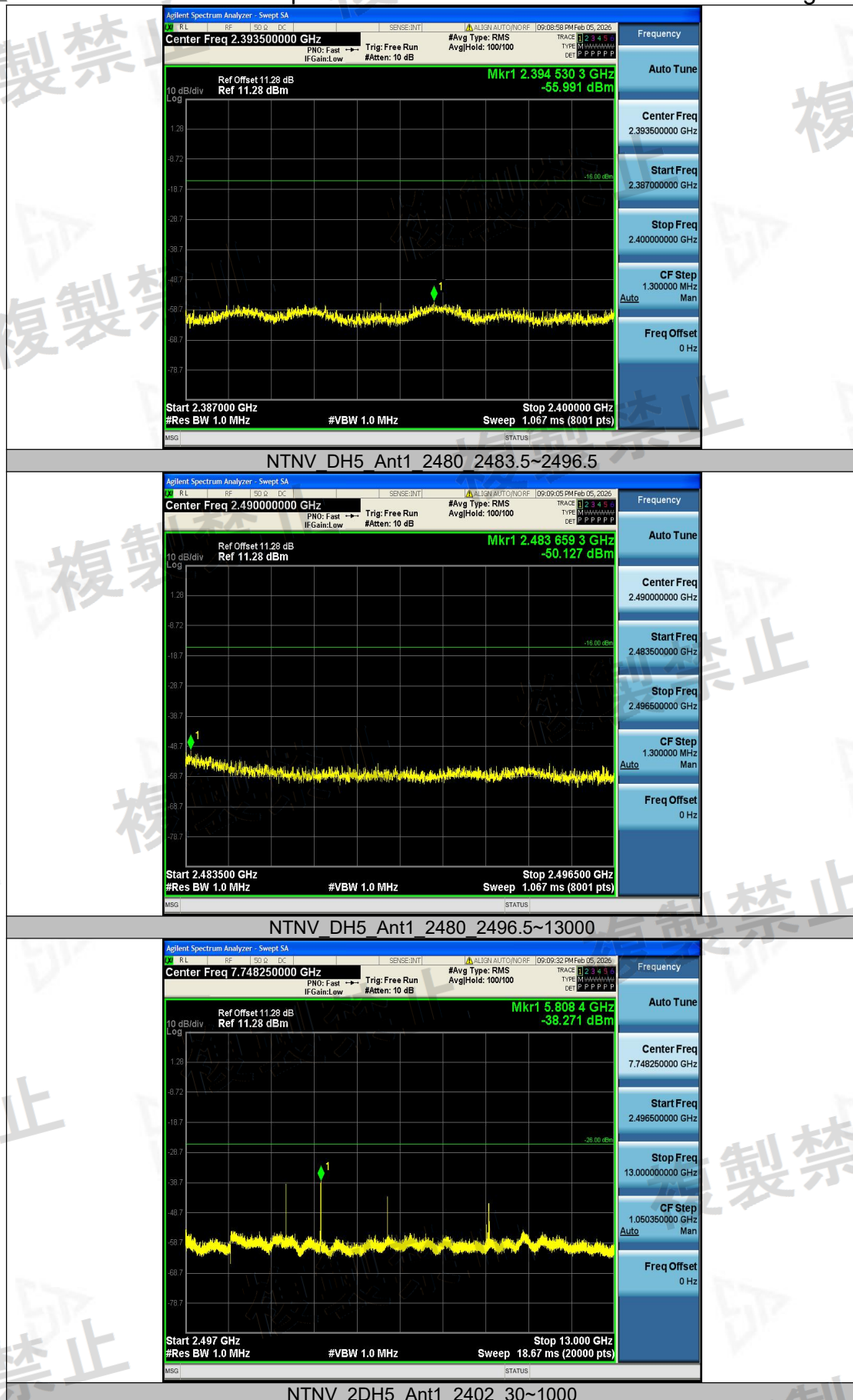
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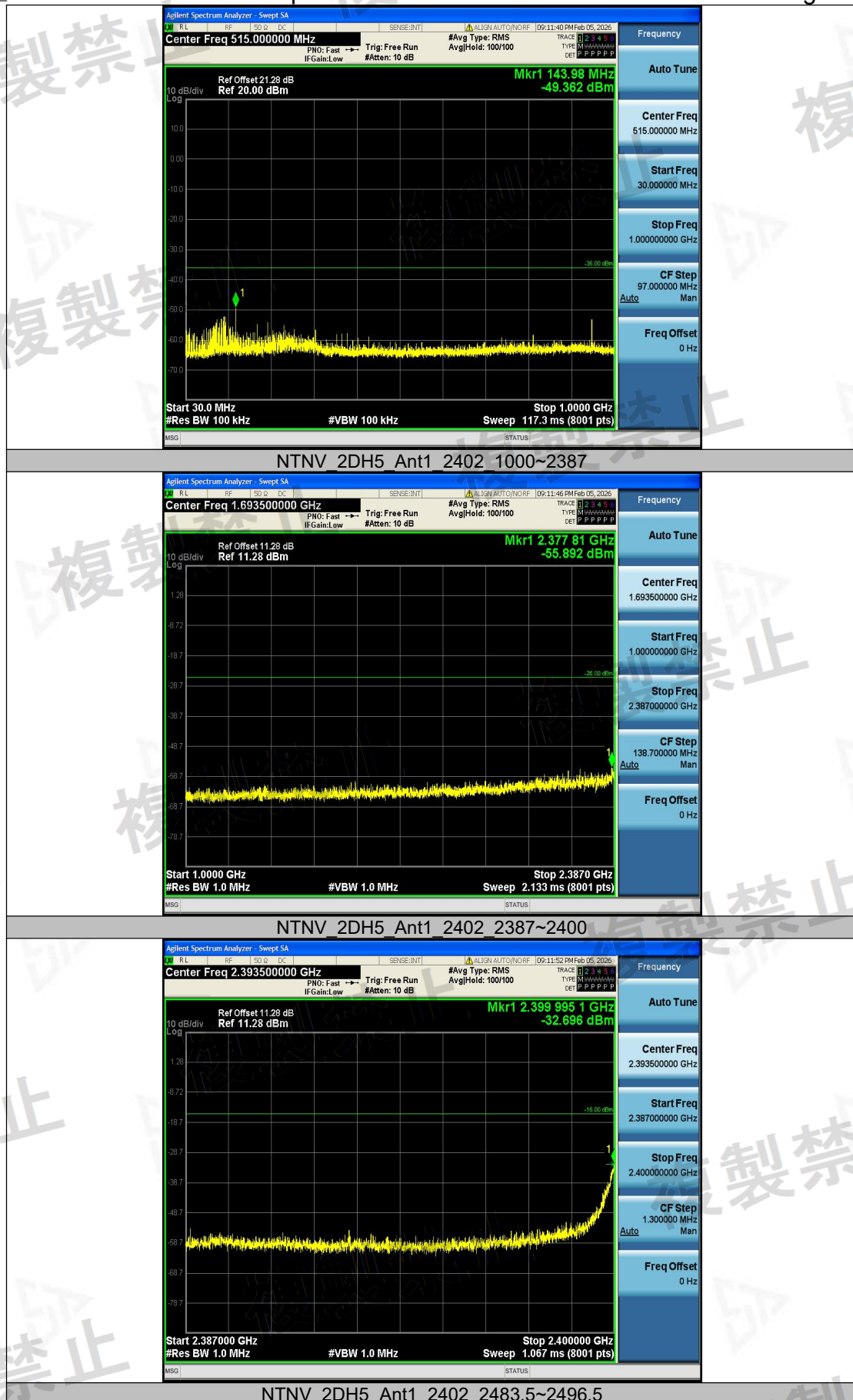
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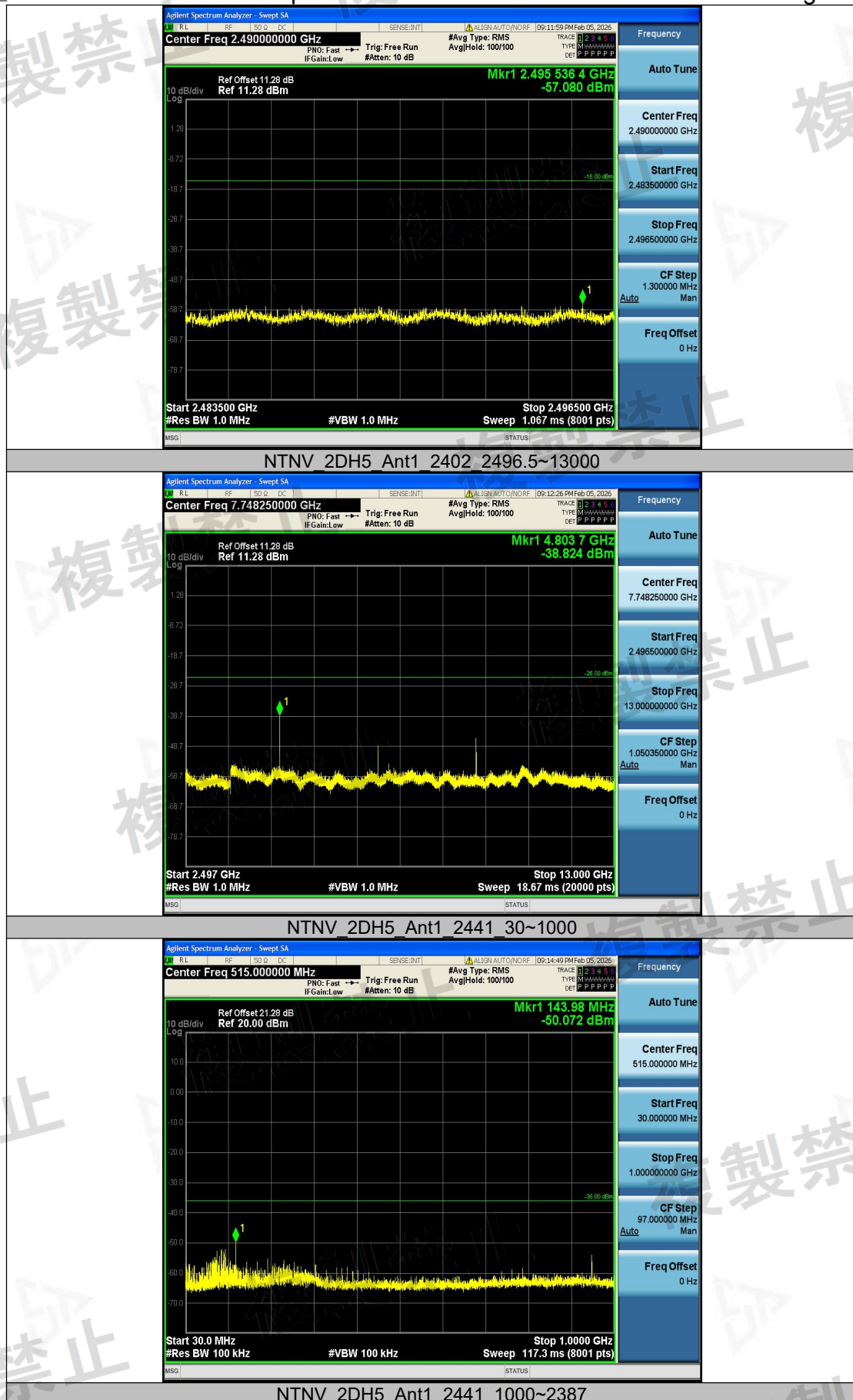


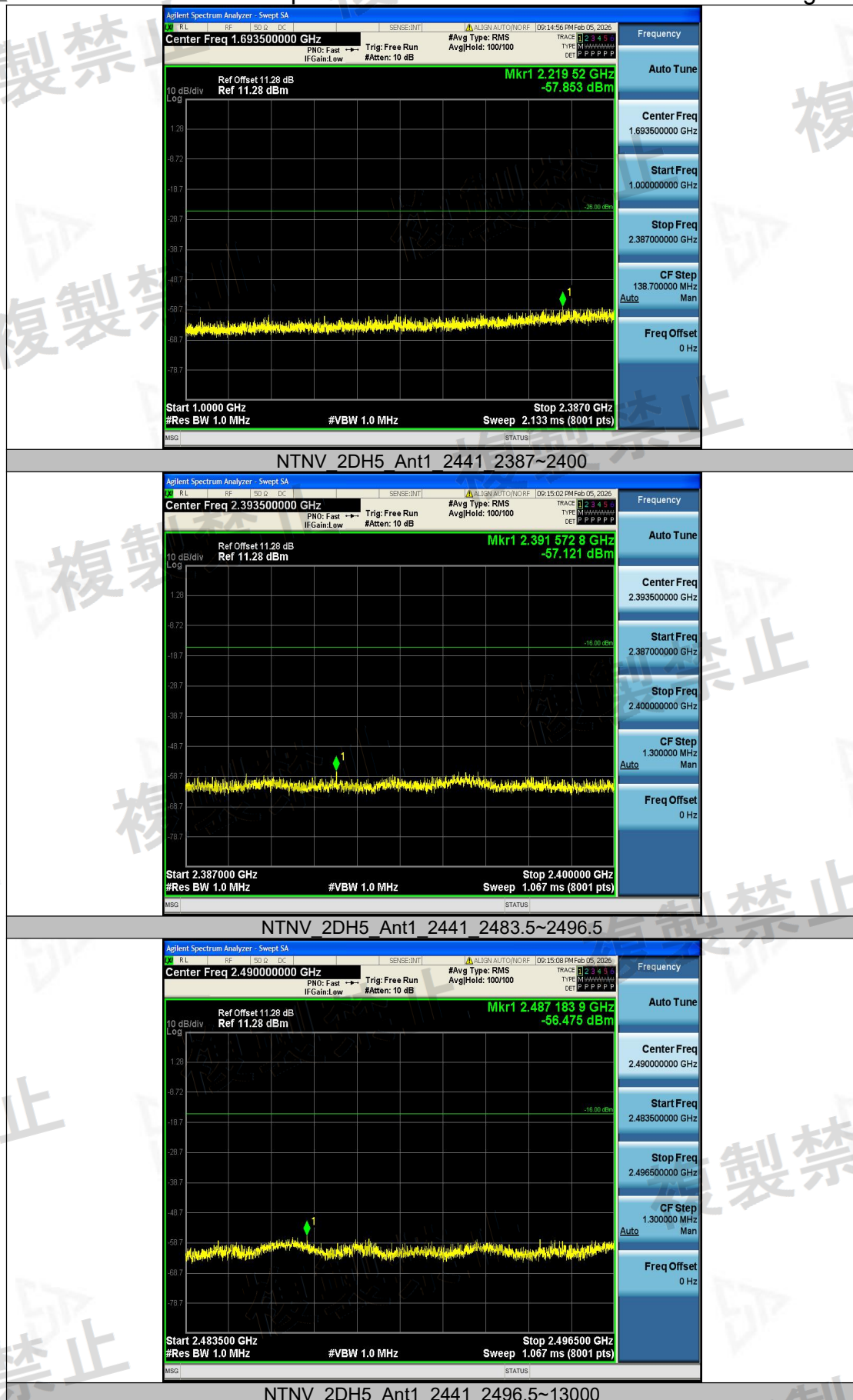


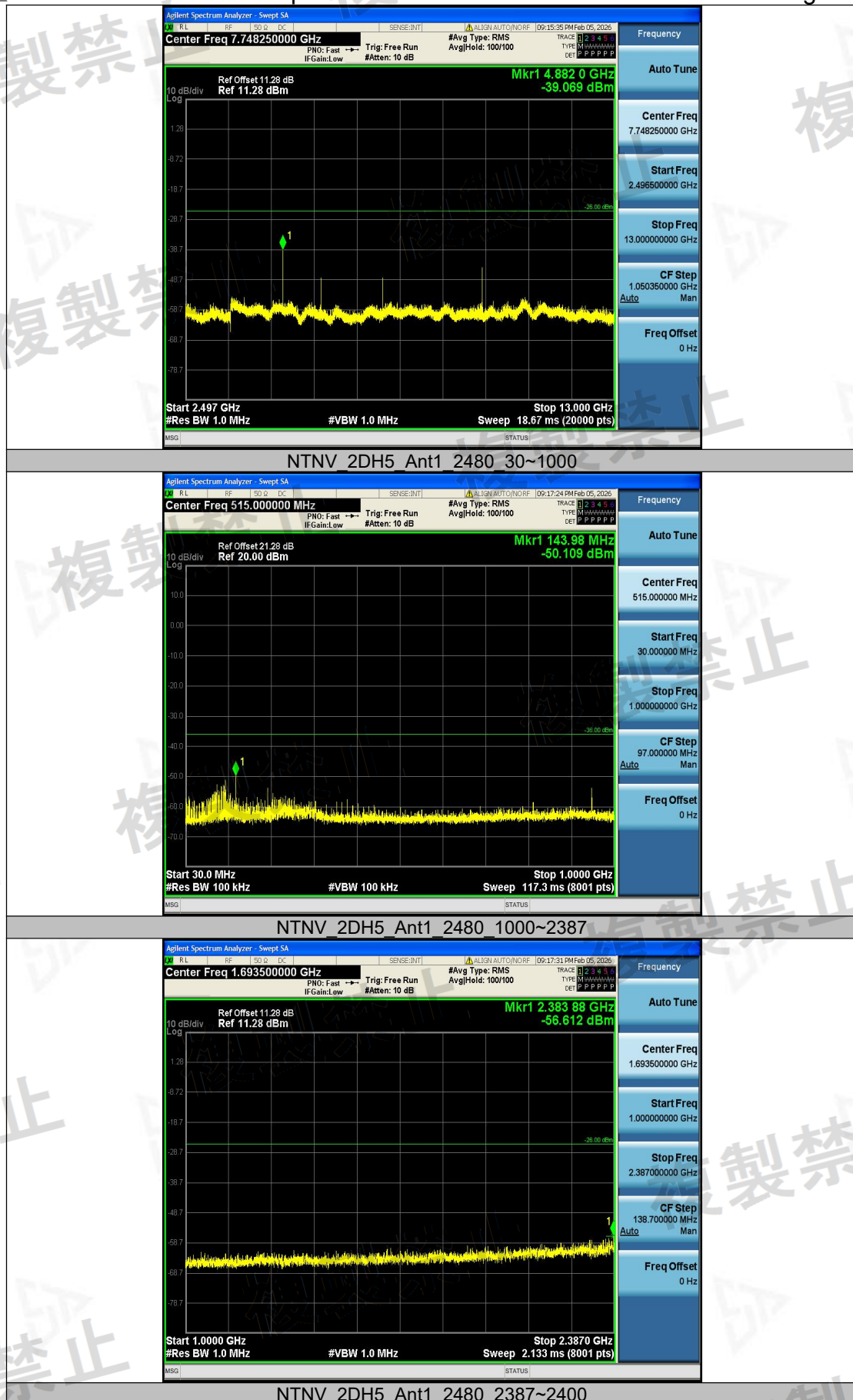


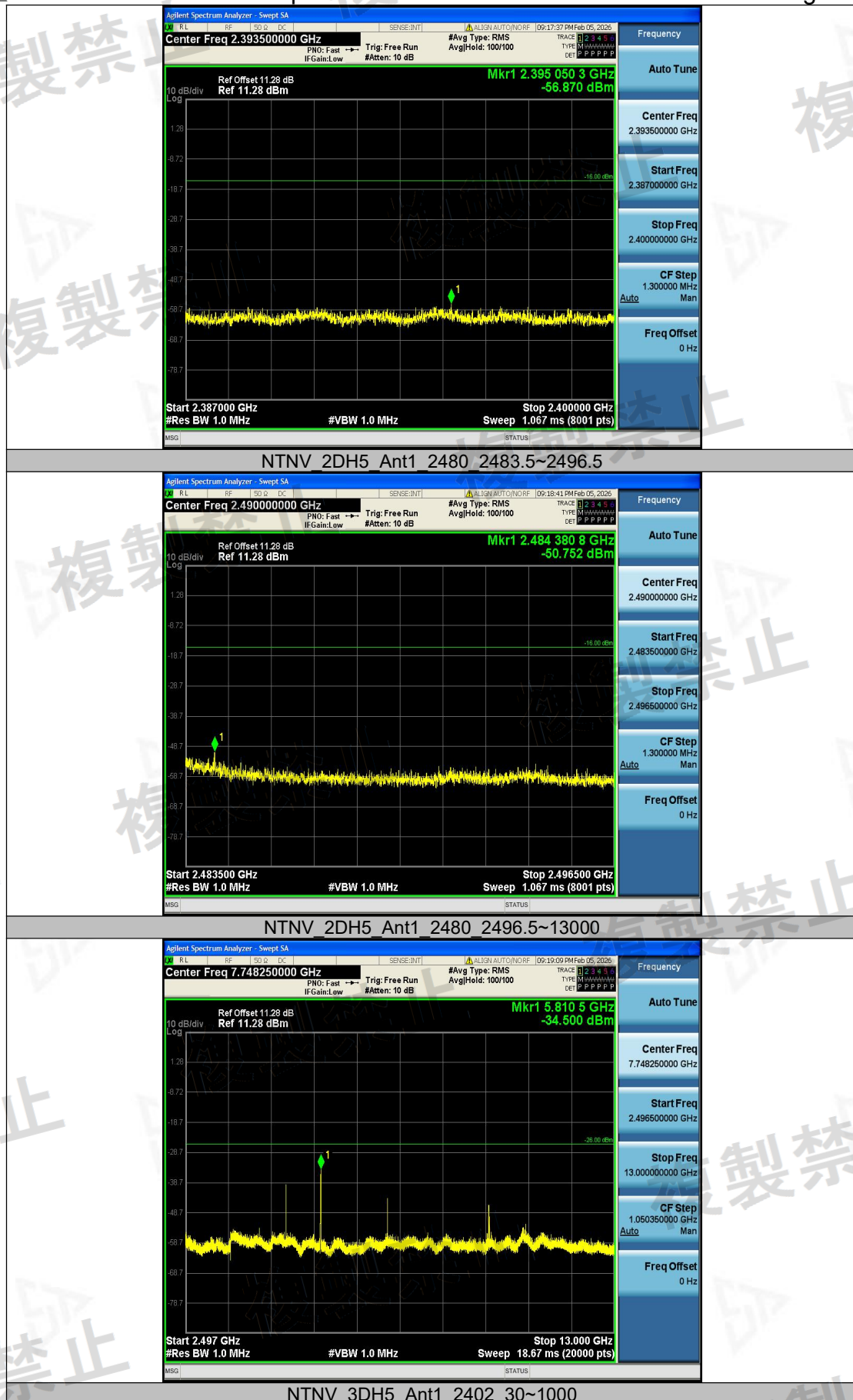


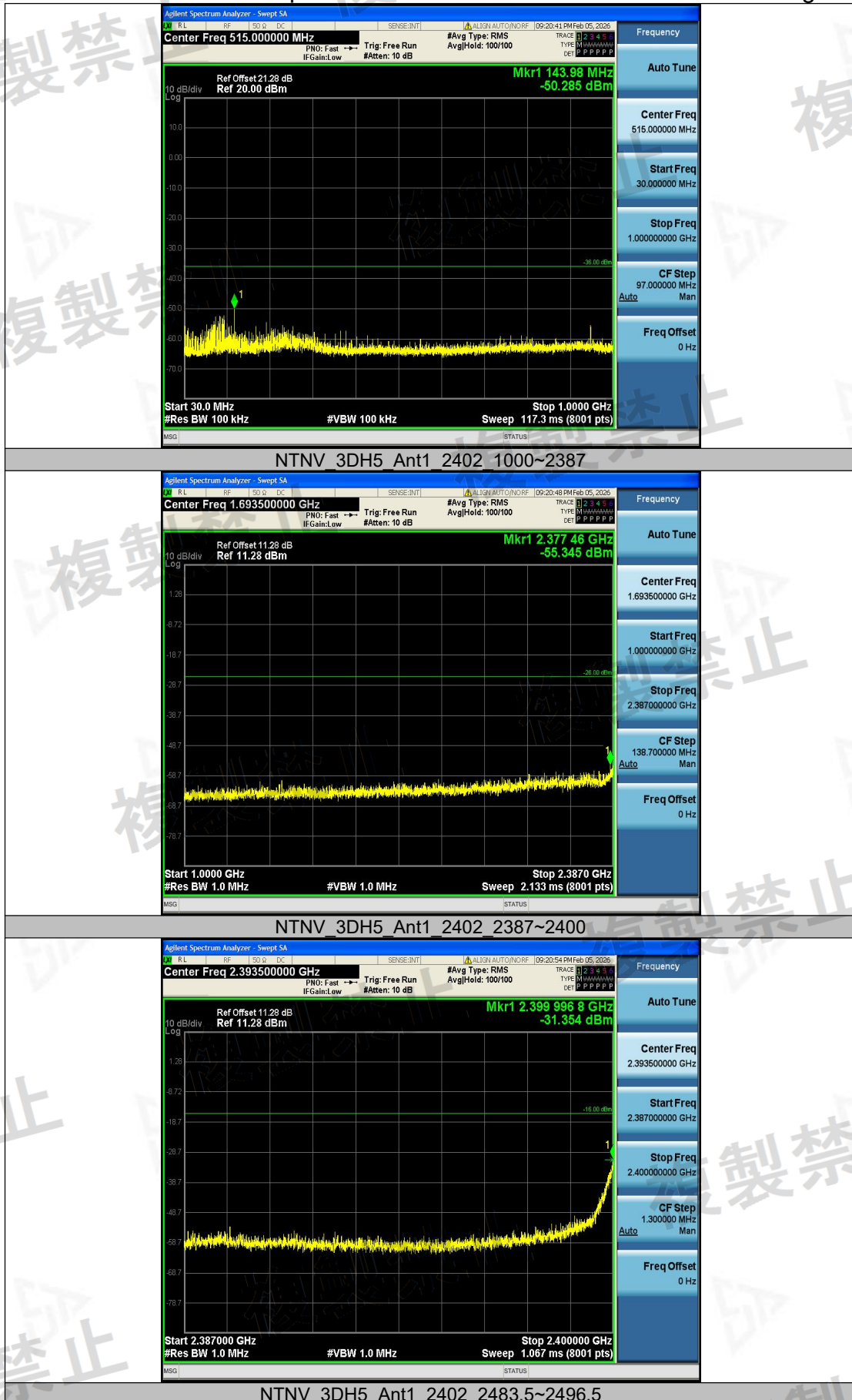


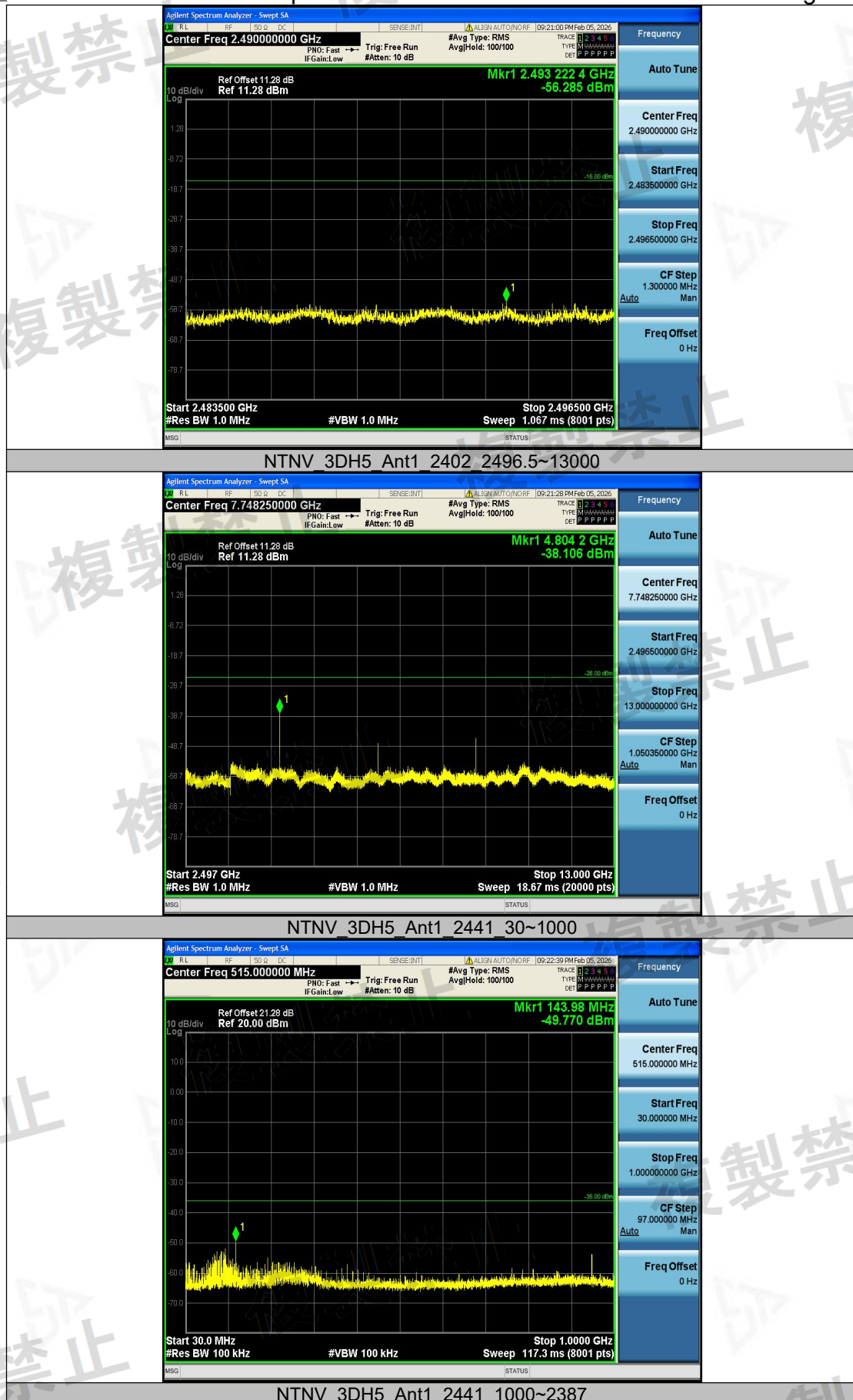


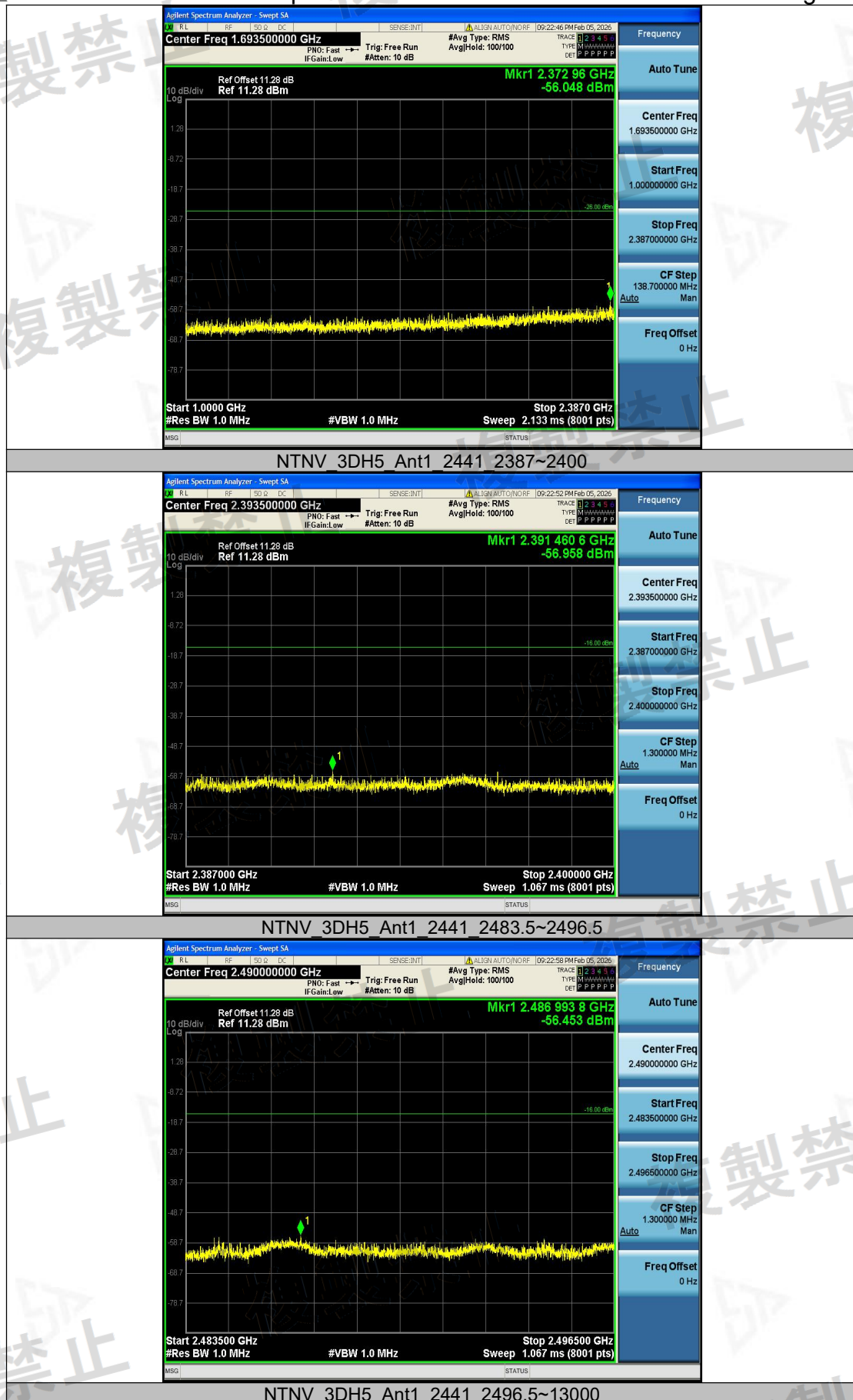


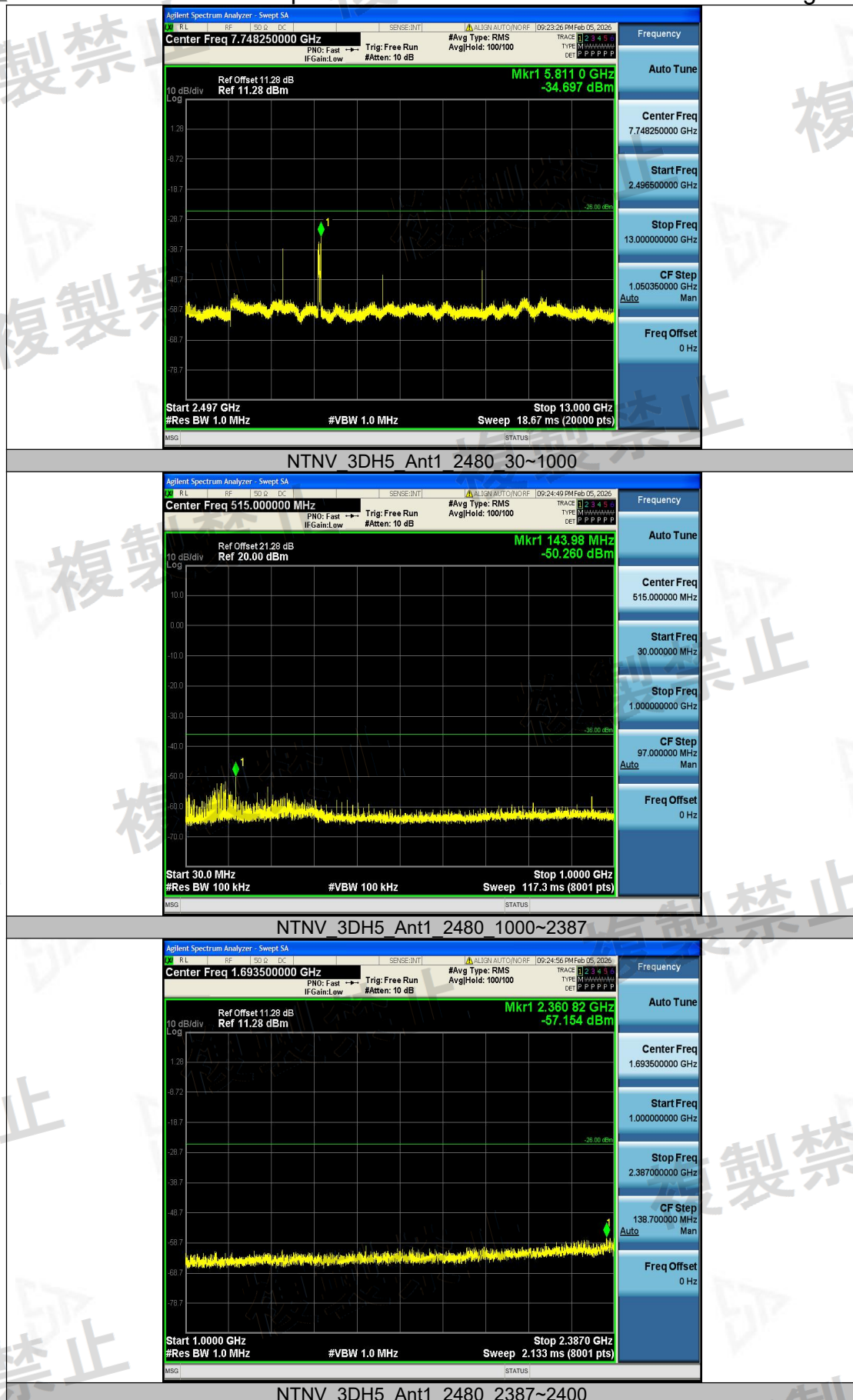


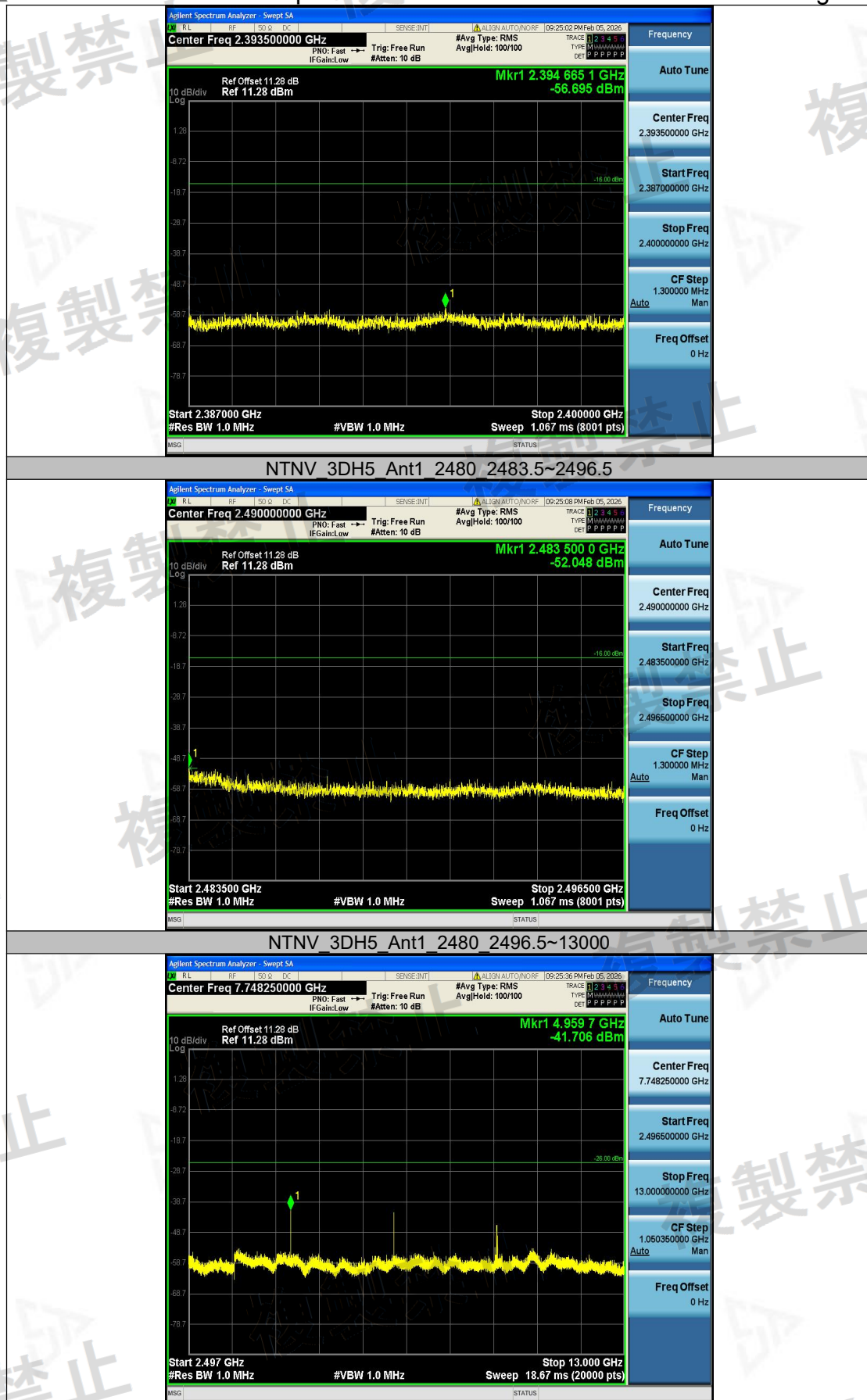












Note: SA set to from 2.4965GHz to 13GHz, plot shows from 2.497GHz to 13GHz as of SA's default format.

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4.4. ANTENNA POWER ERROR MEASUREMENT

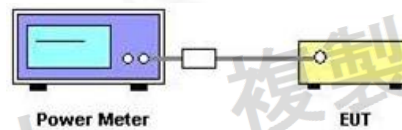
4.4.1. LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2402~2480MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error	+20%(Base on manufacturer declare antenna power density)

4.4.2. TEST PROCEDURES

1. The EUT was directly connected to the power meter.
2. The EUT was programmed to be in continuously transmittin mode.

4.4.3. TEST SETUP LAYOUT



4.4.4. EST DEVIATION

There is no deviation with the original standard.

4.4.5. TEST RESULT OF ANTENNA POWER ERROR

Modulation	Mode	Power	Power	Spread Bandwidth	Ant Power	Limit	Rated power	Tolerance	Limit	Result
		(dBm)	(mW)				(mW/MHz)			
GFSK	Hopping	1.30	1.3490	70.364	0.0192	3	0.04	-52.00%	$\leq 20\%$	Pass
$\pi/4$ -DQPSK	Hopping	1.79	1.5101	70.987	0.0213	3	0.04	-46.75%	$\leq 20\%$	Pass
8DPSK	Hopping	1.42	1.3868	70.828	0.0196	3	0.04	-51.00%	$\leq 20\%$	Pass

Remark: Ant Powe(mW/MHz) = Power(mW)/Spread Bandwidth(MHz)



4.5. SECONDARY RADIATED EMISSIONS TEST

4.5.1. LIMIT

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

4.5.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

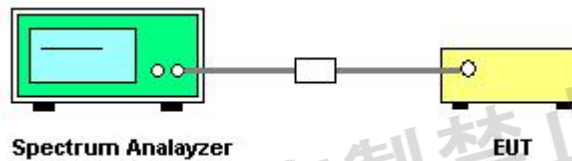
Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.5.3. TEST PROCEDURES

1. EUT have the continuous receptio and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) /
AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.



4.5.4. TEST SETUP LAYOUT



4.5.6. TEST DEVIATION

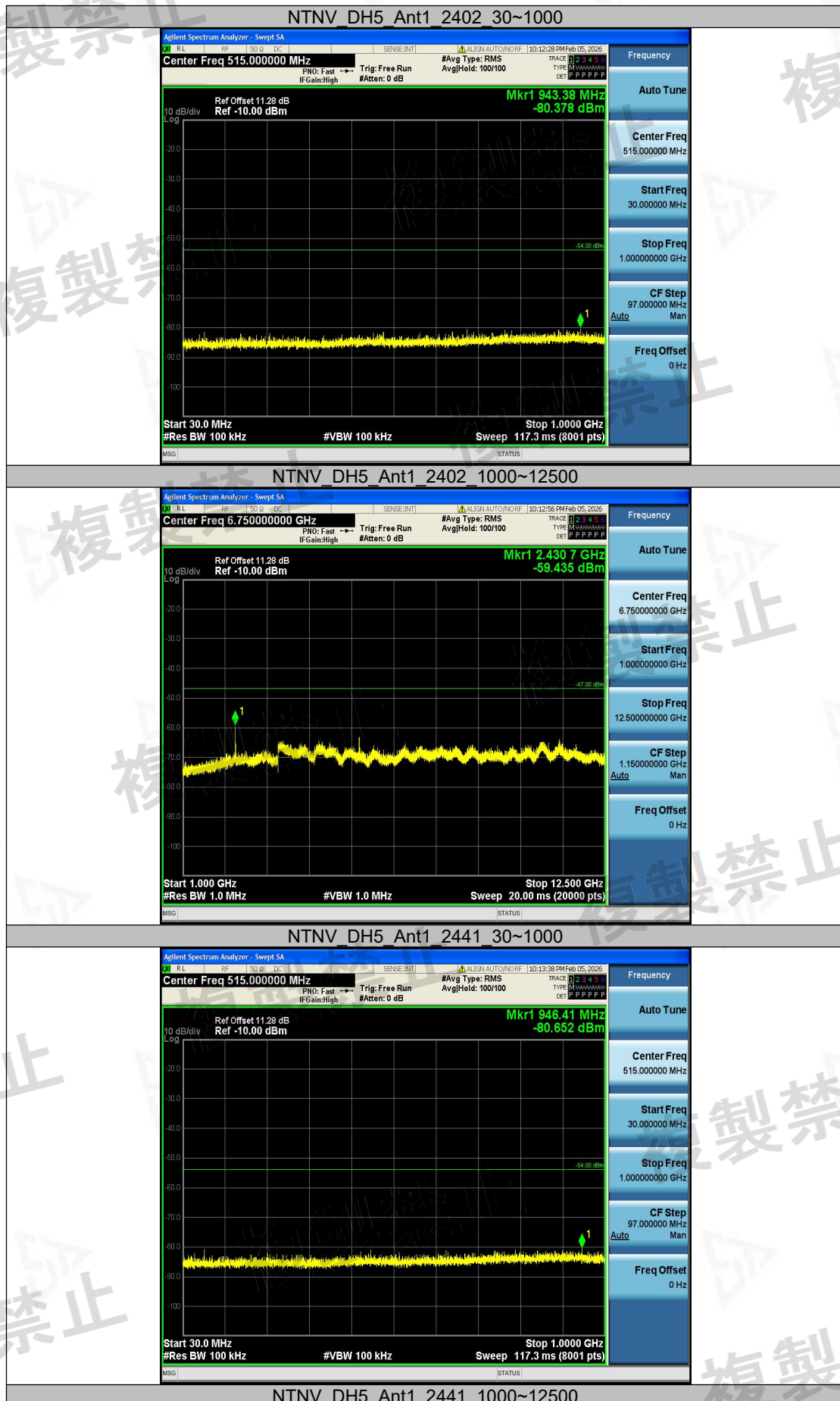
There is no deviation with the original standard.

4.5.7. EUT OPERATION DURING TEST

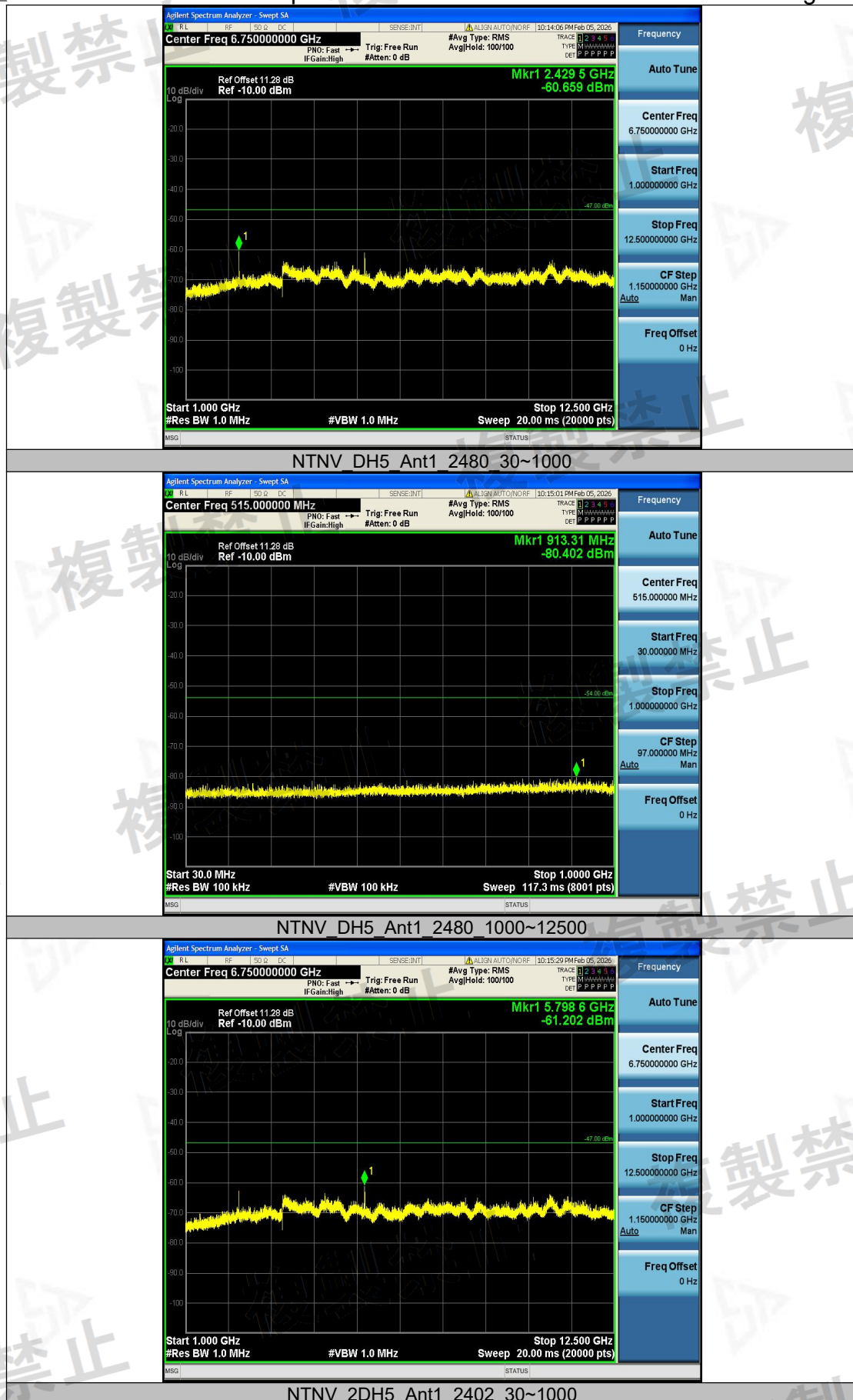
The EUT was programmed to be in continuously reception mode.

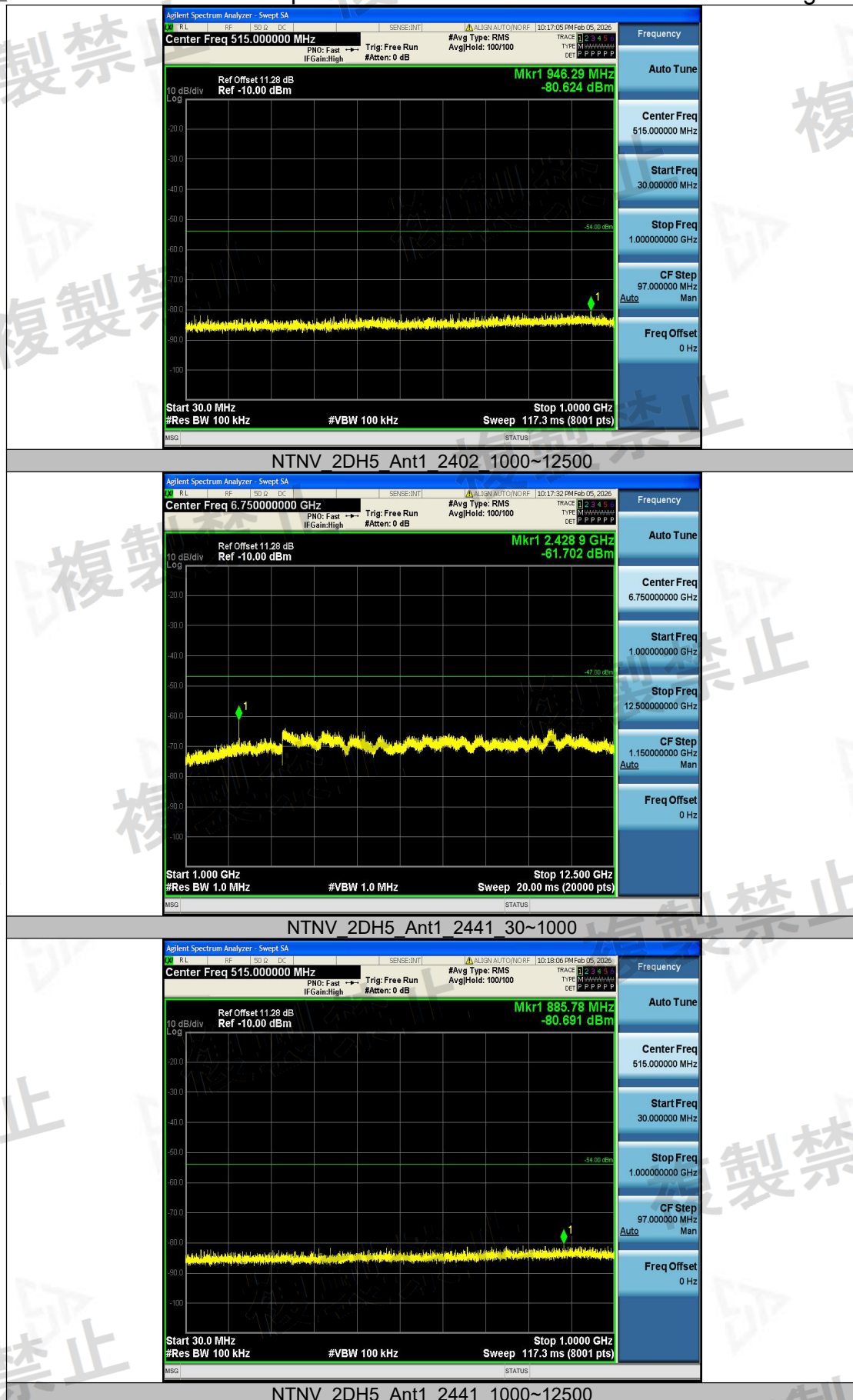
4.5.8. TEST RESULT

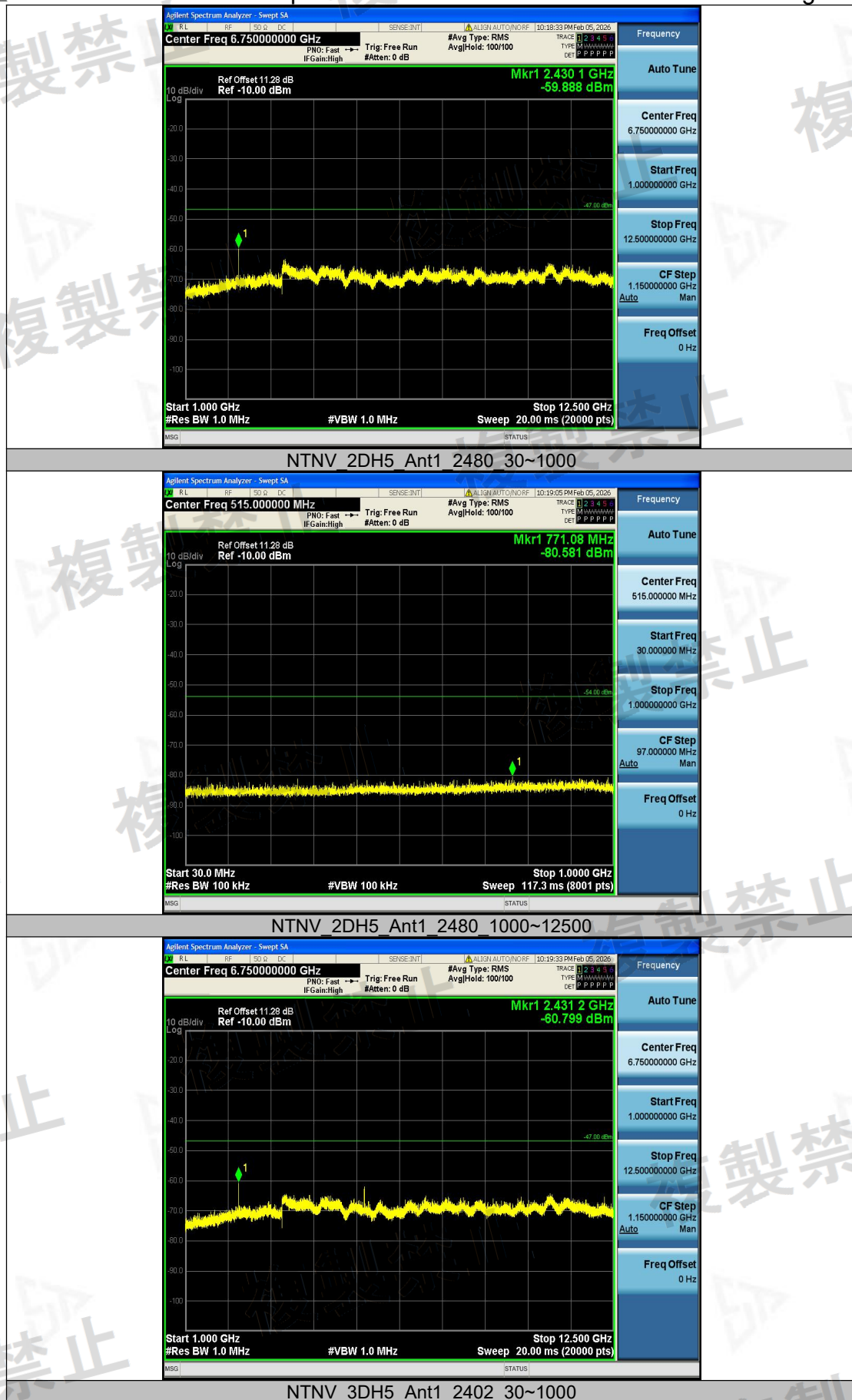
Test Condition	Test Mode	Antenna	Channel	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	DH5	Ant1	2402	30~1000	-80.38	≤-54	0.00916	≤4	PASS
				1000~12500	-59.44	≤-47	1.13763	≤20	PASS
			2441	30~1000	-80.65	≤-54	0.00861	≤4	PASS
				1000~12500	-60.66	≤-47	0.85901	≤20	PASS
			2480	30~1000	-80.4	≤-54	0.00912	≤4	PASS
				1000~12500	-61.2	≤-47	0.75858	≤20	PASS
	2DH5	Ant1	2402	30~1000	-80.62	≤-54	0.00867	≤4	PASS
				1000~12500	-61.7	≤-47	0.67608	≤20	PASS
			2441	30~1000	-80.69	≤-54	0.00853	≤4	PASS
				1000~12500	-59.89	≤-47	1.02565	≤20	PASS
			2480	30~1000	-80.58	≤-54	0.00875	≤4	PASS
				1000~12500	-60.8	≤-47	0.83176	≤20	PASS
	3DH5	Ant1	2402	30~1000	-80.48	≤-54	0.00895	≤4	PASS
				1000~12500	-59.31	≤-47	1.17220	≤20	PASS
			2441	30~1000	-79.63	≤-54	0.01089	≤4	PASS
				1000~12500	-59.16	≤-47	1.21339	≤20	PASS
			2480	30~1000	-80.7	≤-54	0.00851	≤4	PASS
				1000~12500	-58.52	≤-47	1.40605	≤20	PASS

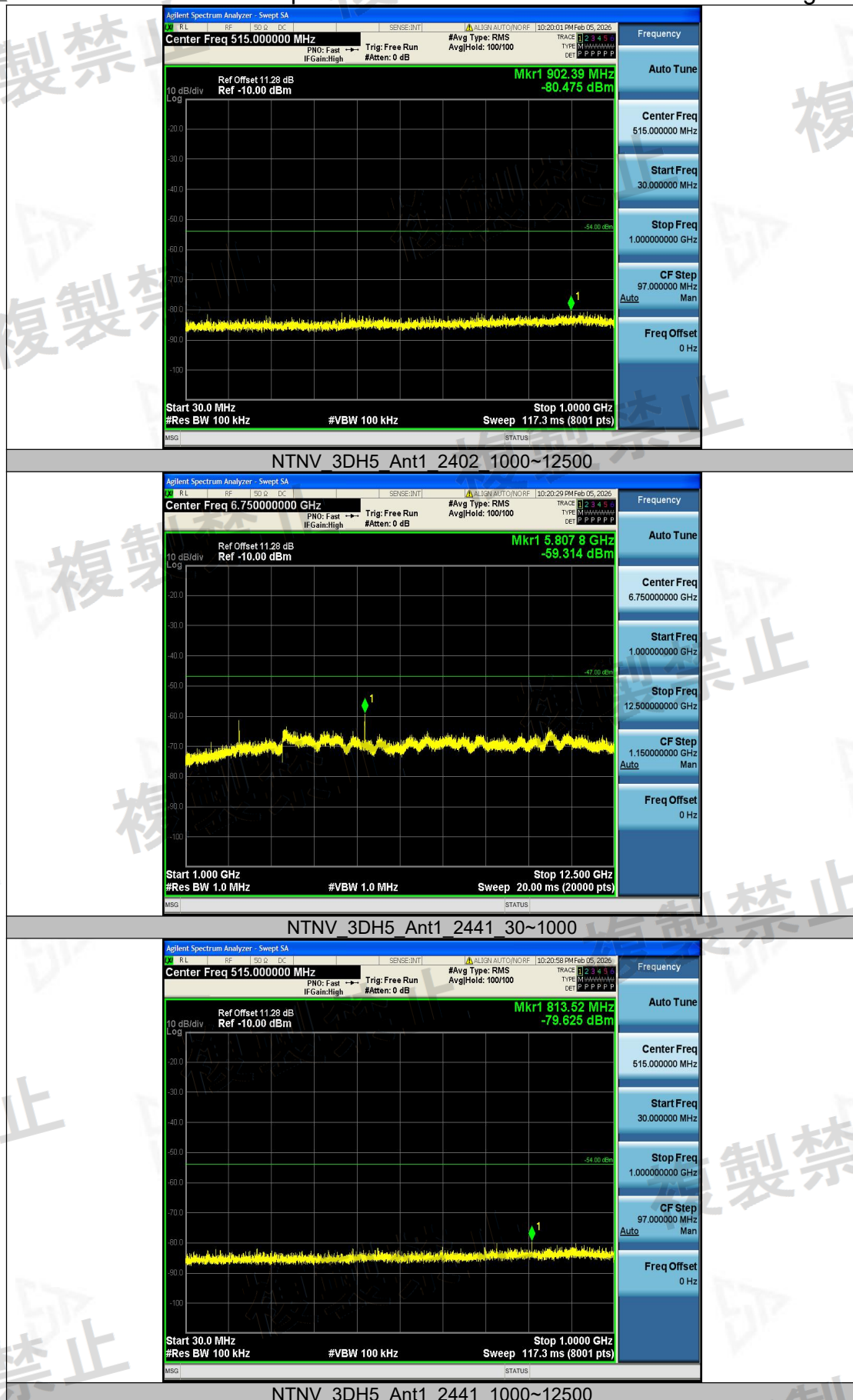


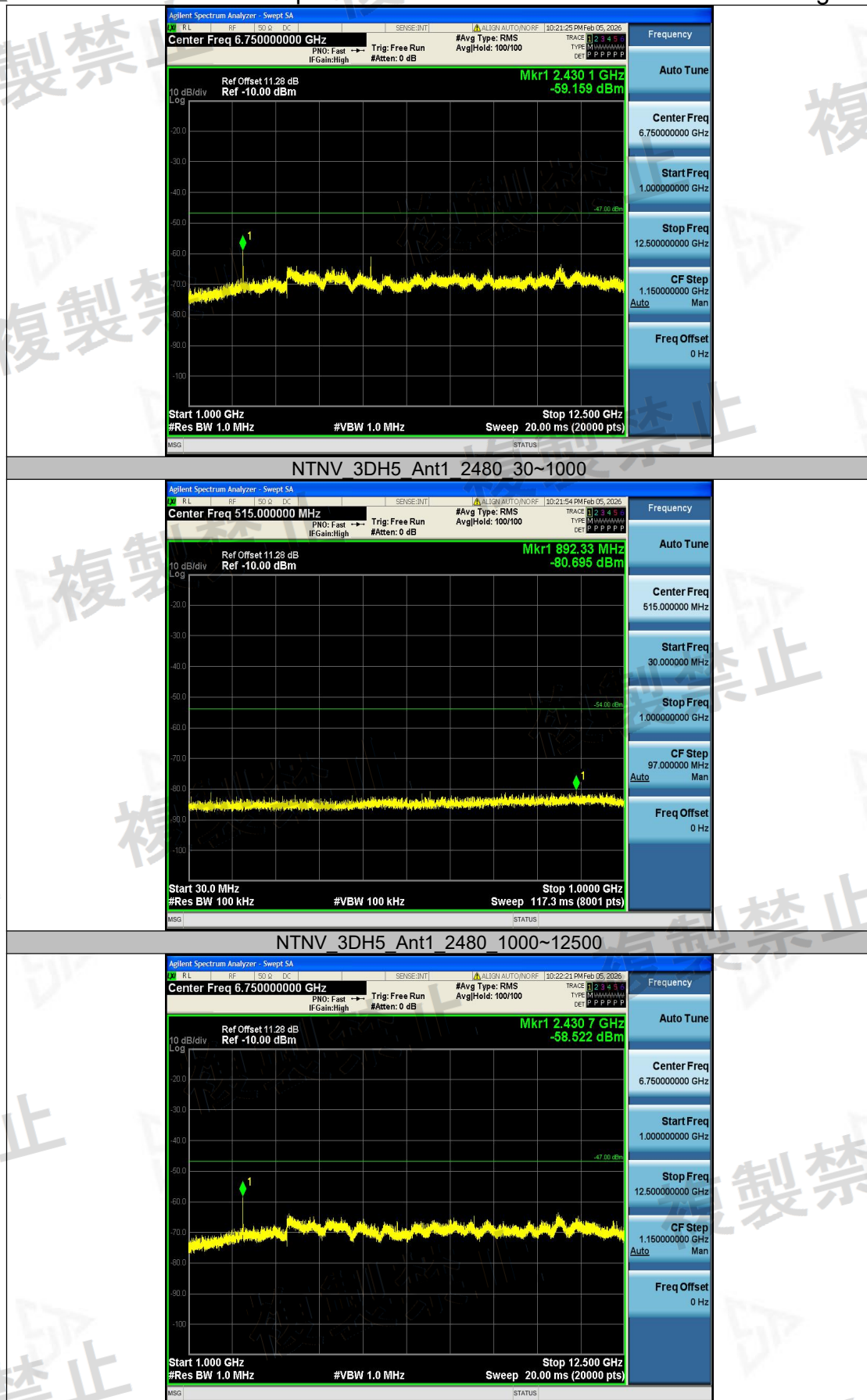
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**4.6. WELL TIME****4.6.1. LIMIT**

Item	Limits
Hopping Freq. Dwell Time	$\leq 0.4 \text{ sec (In } 0.4 \text{ sec} \times \text{ spreading rate)}$

4.6.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep	Continuous

4.6.3. TEST PROCEDURES

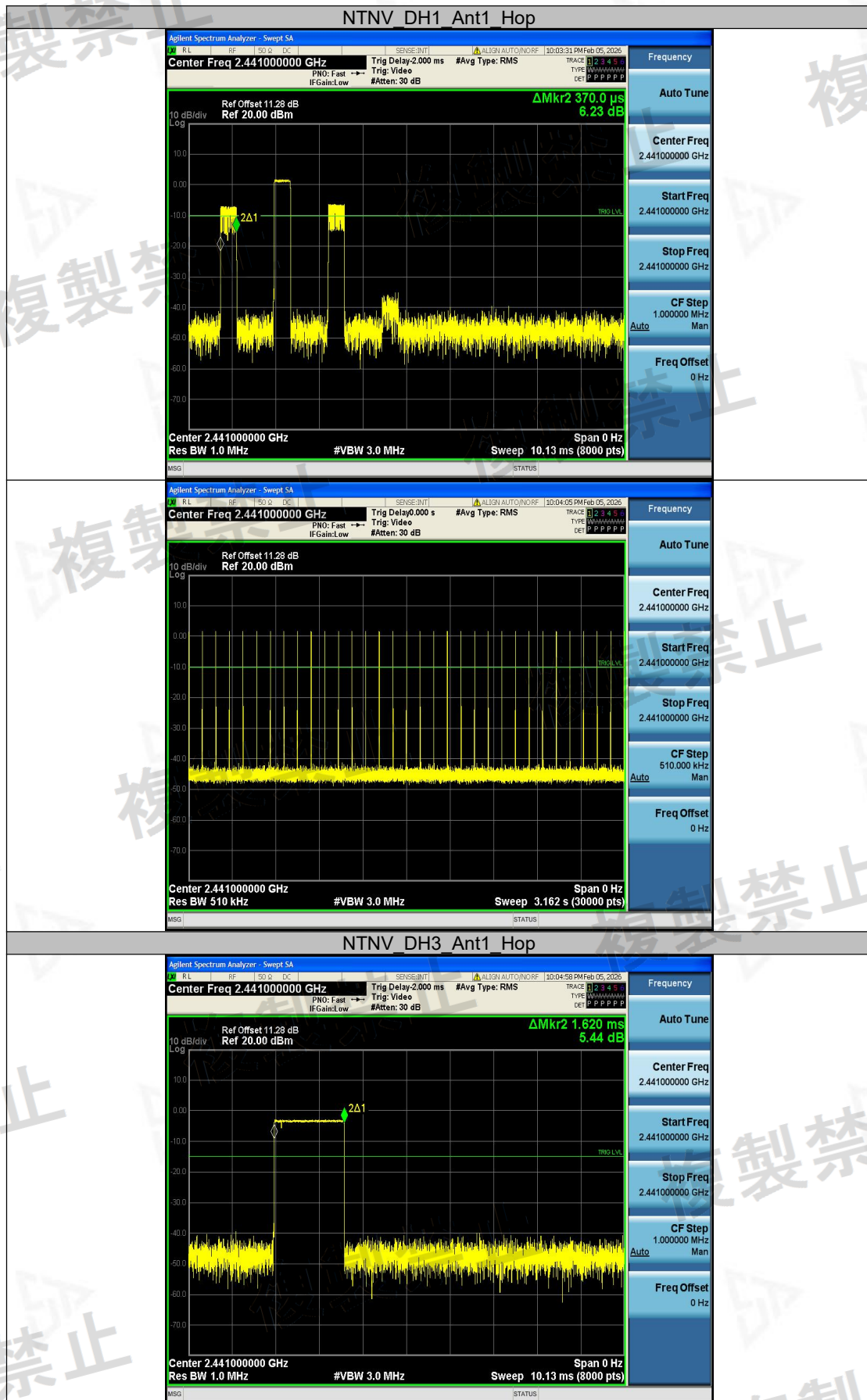
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Use a video trigger with the trigger level set to enable triggering only on full pulses.
4. Sweep Time is more than once pulse time.
5. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
6. Measure the maximum time duration of one single pulse.
7. Set the EUT for DH5, DH3 and DH1 packet transmitting.
8. Measure the maximum time duration of one single pulse.
9. Dwell time = BurstWidth*TotalHops[Num]

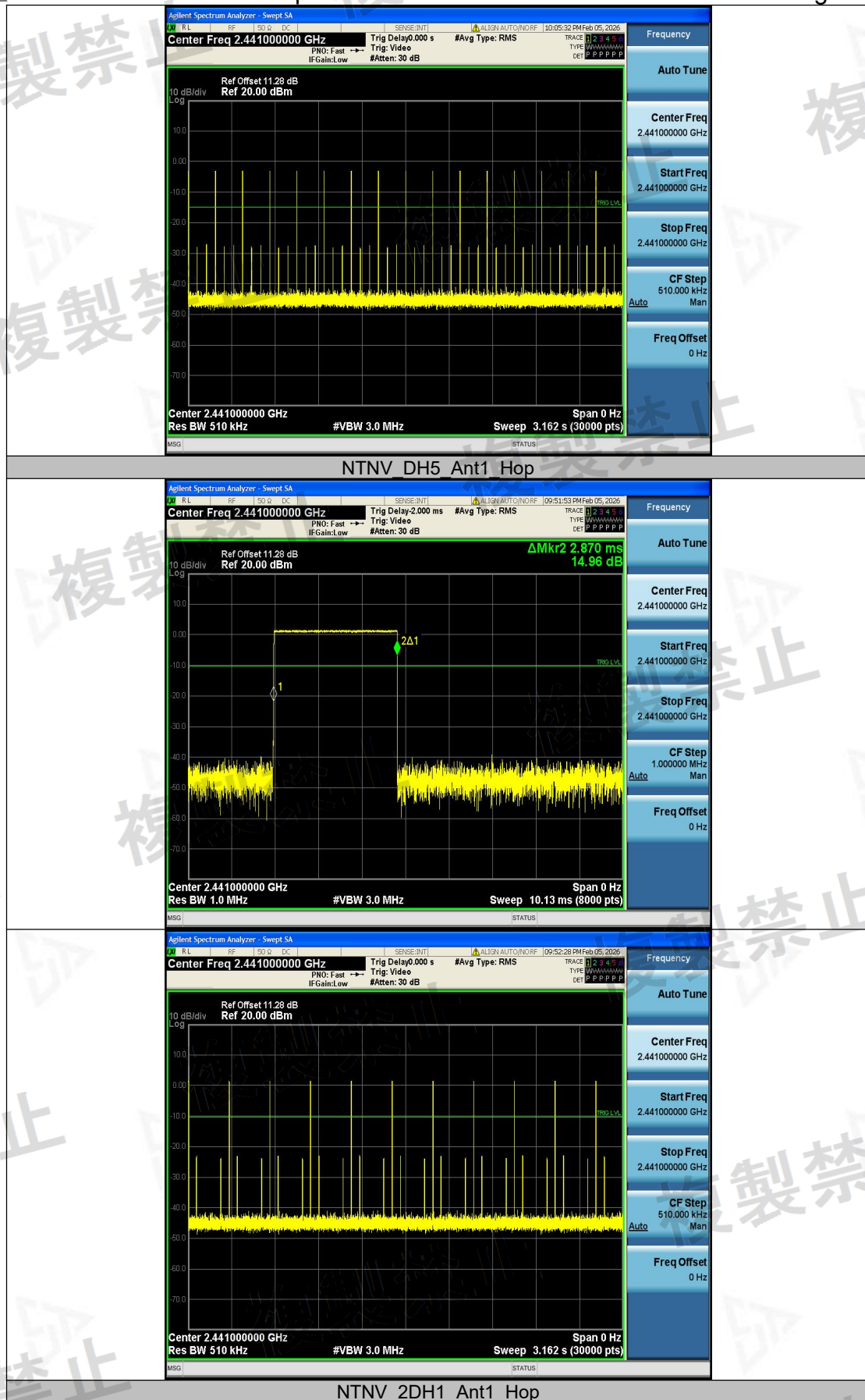
4.6.4. TEST SETUP LAYOUT**4.6.6. EUT OPERATION DURING TEST**

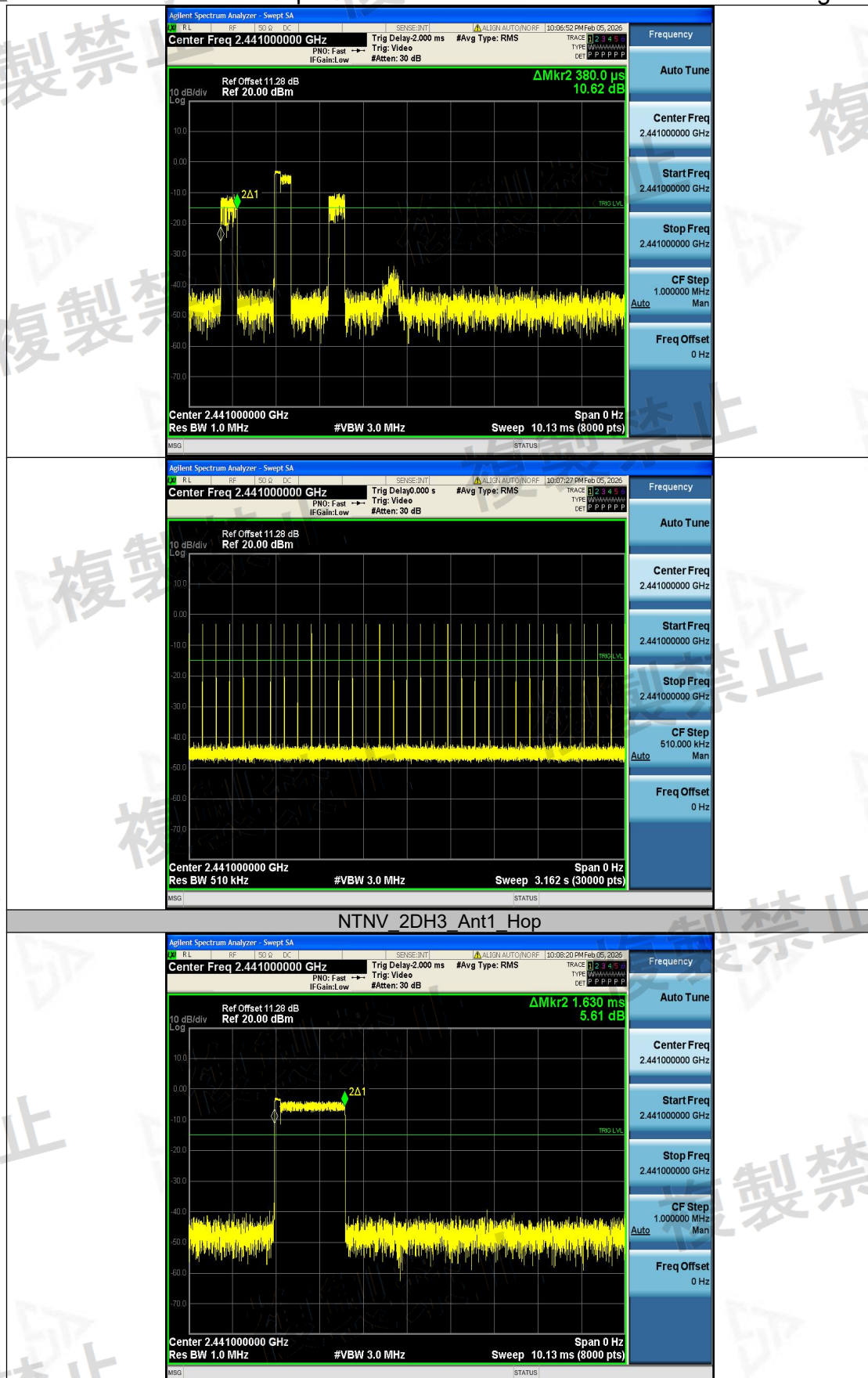
The EUT was programmed to be in continuously transmittin mode.

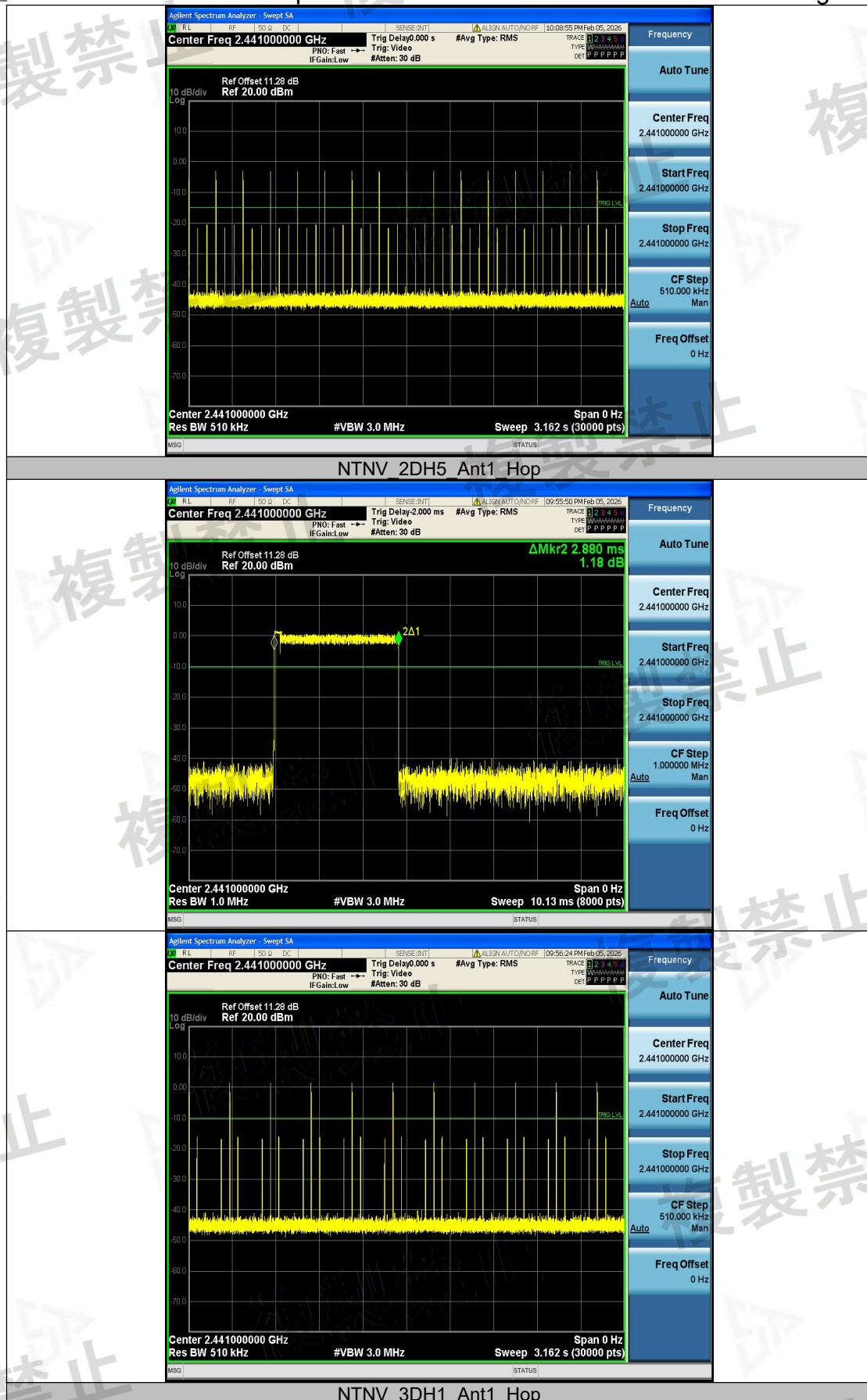
4.6.7. TEST RESULT

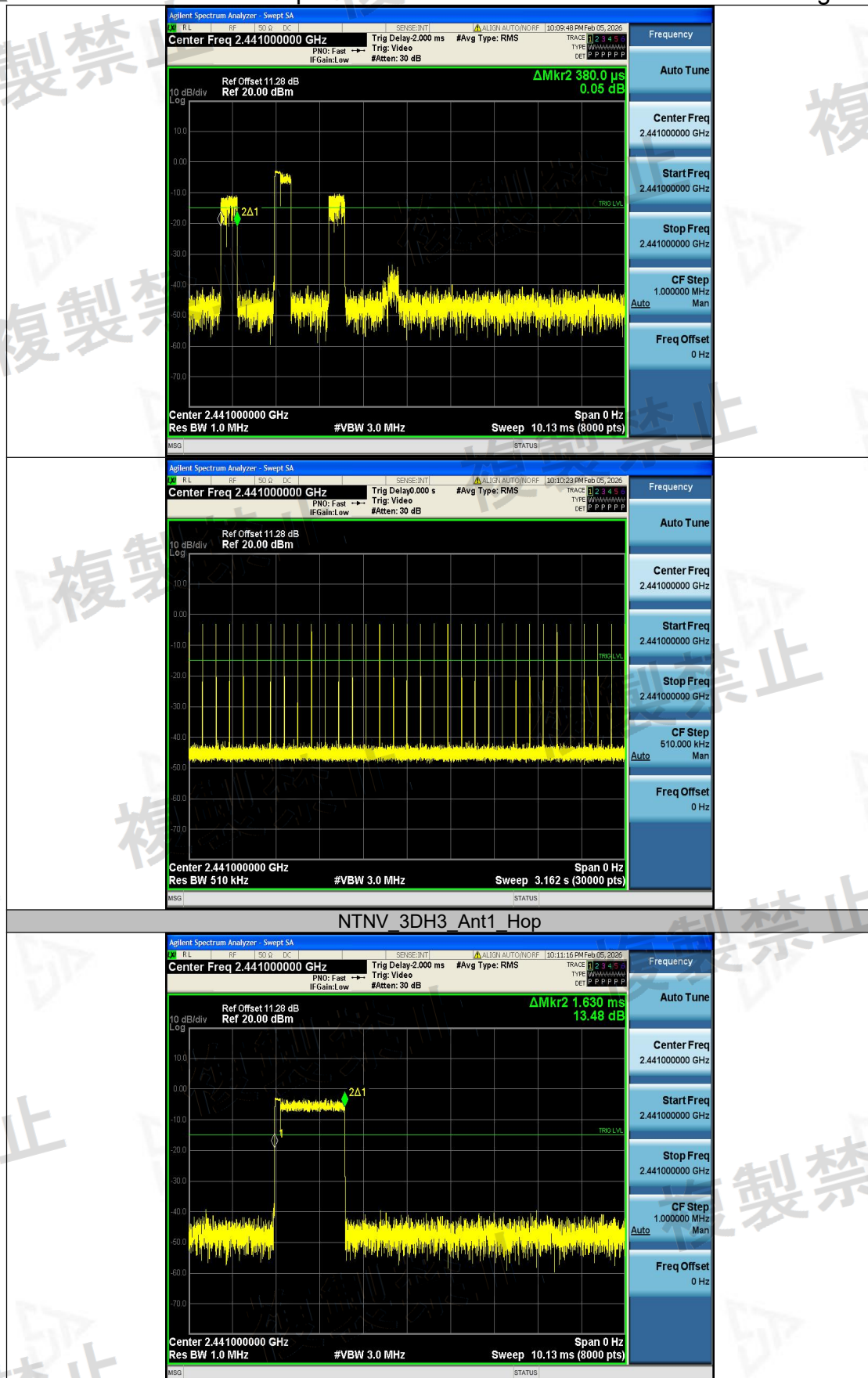
Normal Voltage						
Test Mode	Channel	BurstWidth [ms]	TotalHops[Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.37	330	0.122	≤ 0.4	Pass
DH3	Hop	1.62	160	0.259	≤ 0.4	Pass
DH5	Hop	2.87	110	0.316	≤ 0.4	Pass
2DH1	Hop	0.38	330	0.125	≤ 0.4	Pass
2DH3	Hop	1.63	160	0.261	≤ 0.4	Pass
2DH5	Hop	2.88	110	0.317	≤ 0.4	Pass
3DH1	Hop	0.38	330	0.125	≤ 0.4	Pass
3DH3	Hop	1.63	160	0.261	≤ 0.4	Pass
3DH5	Hop	2.88	110	0.317	≤ 0.4	Pass

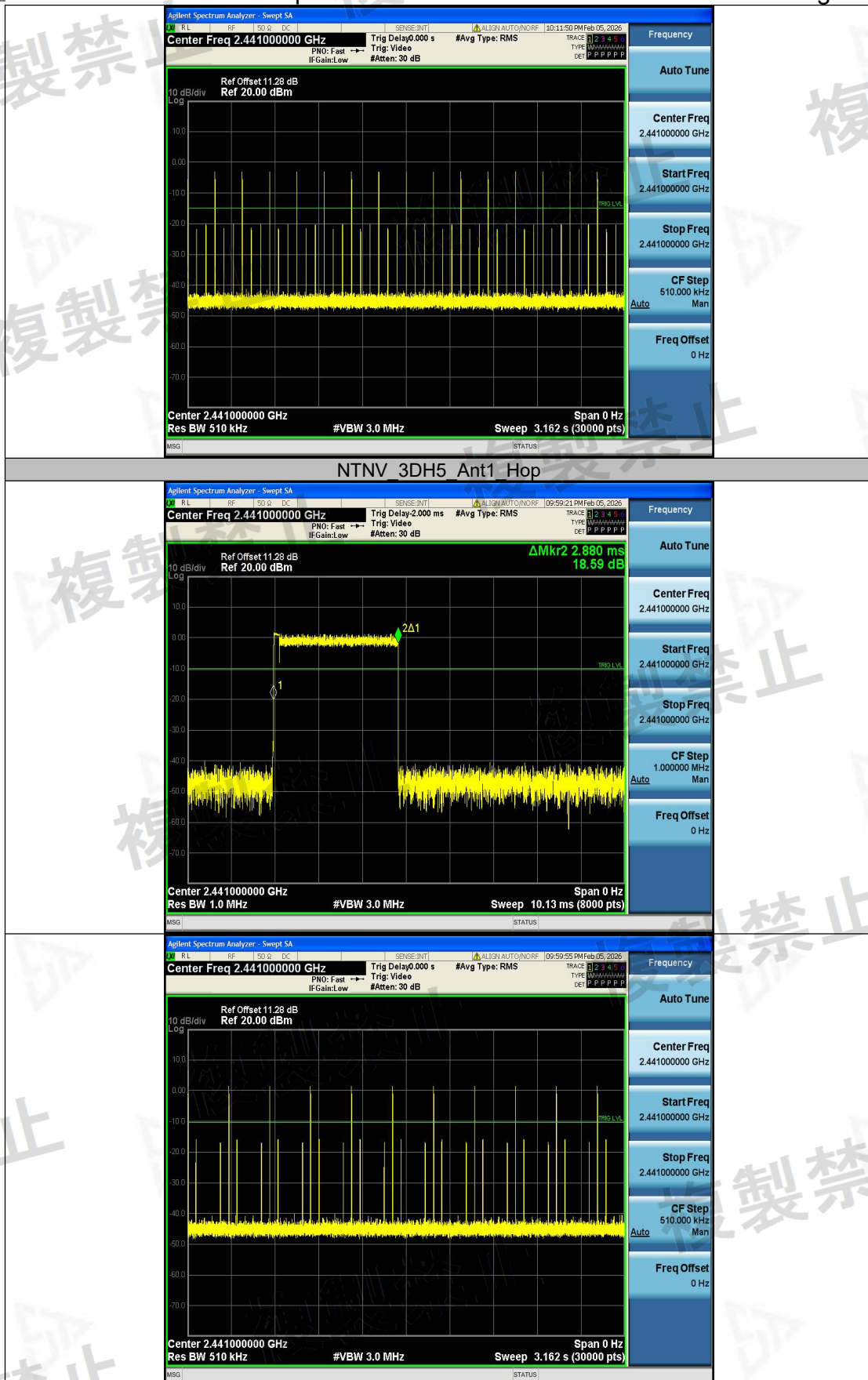














4.7. SPREADING FACTOR

According to Radio Law Radio Equipment Regulations Article 6, Attached Table No.2, the Occupied Bandwidth must be 83.5 MHz or below. According to Article 49-20, the Spread Bandwidth must be 500kHz or more, and Spreading Factor must be 5 or more.

Note: Refer to section 4.2.6 for test results.

4.8. INTERFERENCE PREVENTION FUNCTION

4.8.1. LIMIT

Item	Limits
Identification code	≥ 48 bits

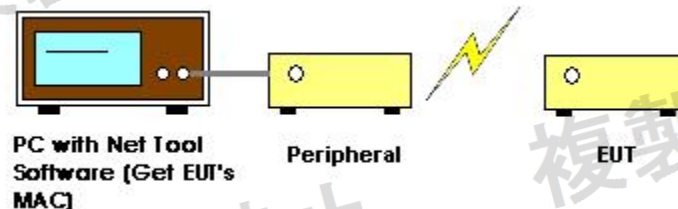
4.8.2. MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

4.8.3. TEST PROCEDURES

- In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the signals other than predetermined ID codes from the counterpart. d. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

4.8.4. TEST SETUP LAYOUT



4.8.5. TEST DEVIATION

There is no deviation with the original standard.

4.8.6. EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmittin mode.

4.8.7. TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

Normal voltage	High voltage	Low voltage	Result
OK	OK	OK	Pass
Address: 5e55058a34ec			

**4.9 TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT****4.9.1. LIMIT**

Item	Limits
EIRP Power Density	$\leq 6.91\text{dBm/MHz}$ (FH form 2400~2483.5MHz) $\leq 12.14\text{dBm/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 12.14\text{dBm}$ (Other from 2400~2483.5MHz)

4.9.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

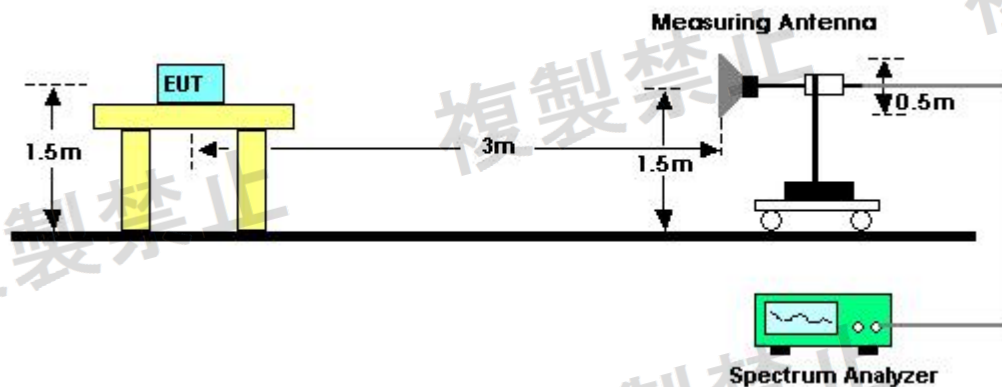
4.9.3. TEST PROCEDURES

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read as "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at P_t to give the equivalent output level of "E" or calculate P_t with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the P_t .
7. Calculate EIRP by the formula below $\text{EIRP} = G_t - L + P_t$.
 G_t : gain of replacing antenna (dBi)
 L : feeder loss between SSG and replacing antenna
 P_t : Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

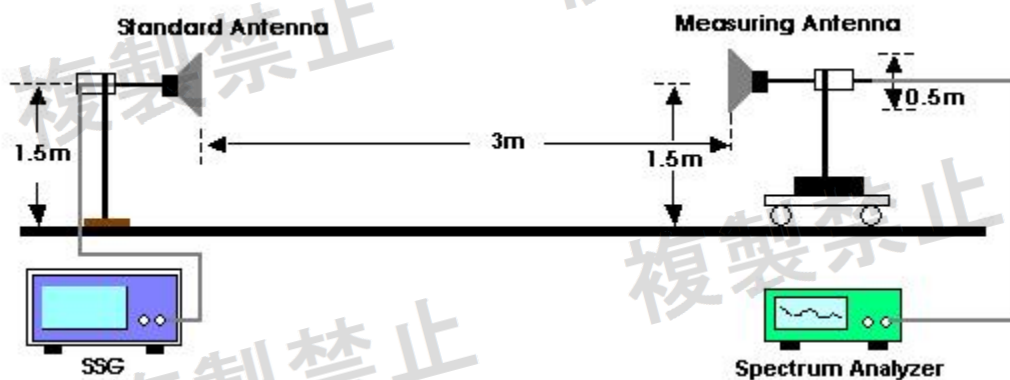


4.9.4. TEST SETUP LAYOUT

For EUT radiation measurement



For standard antenna measurement



4.9.5. TEST DEVIATION

There is no deviation with the original standard.

4.9.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmittin mode.

4.9.7. RESULTS OF TRANSMISSION ANTENNA GAIN

Frequency (MHz)	Polarization (H/V)	EIRP Power (dBm/MHz)	Limits (dBm/MHz)
2402	H	3.05	6.91
	V	4.45	6.91
2441	H	3.14	6.91
	V	4.21	6.91
2480	H	4.01	6.91
	V	3.99	6.91



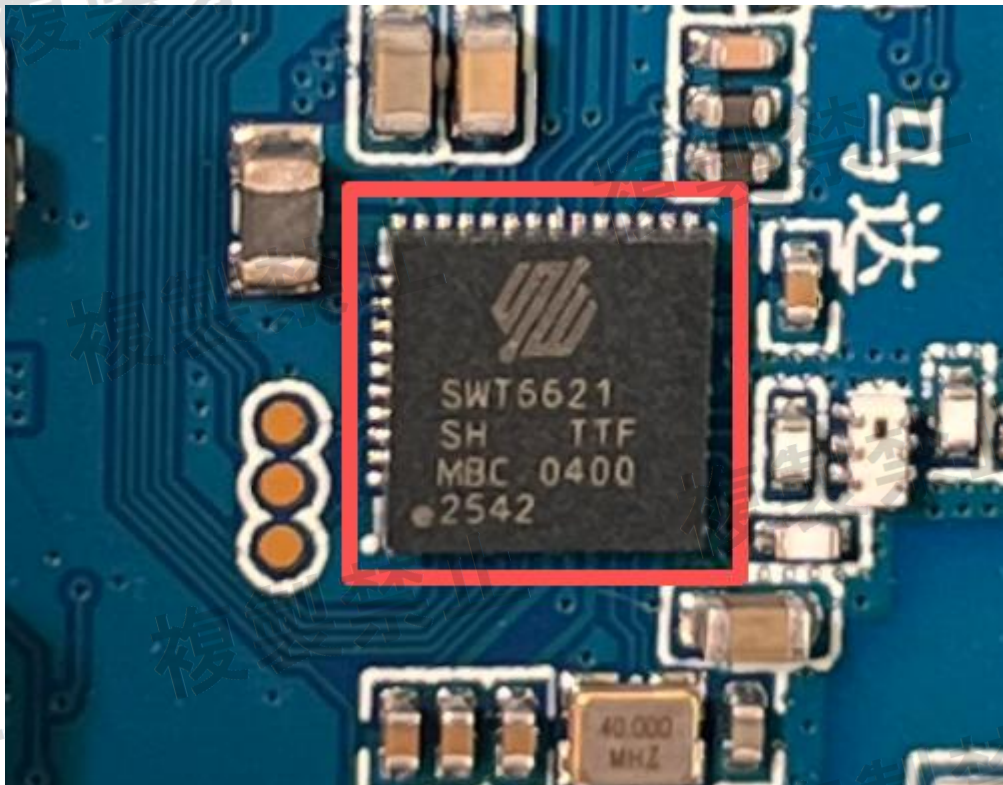
4.10. CONSTRUCTION PROTECTION CONFIRMATION METHOD

4.10.1. LIMIT

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

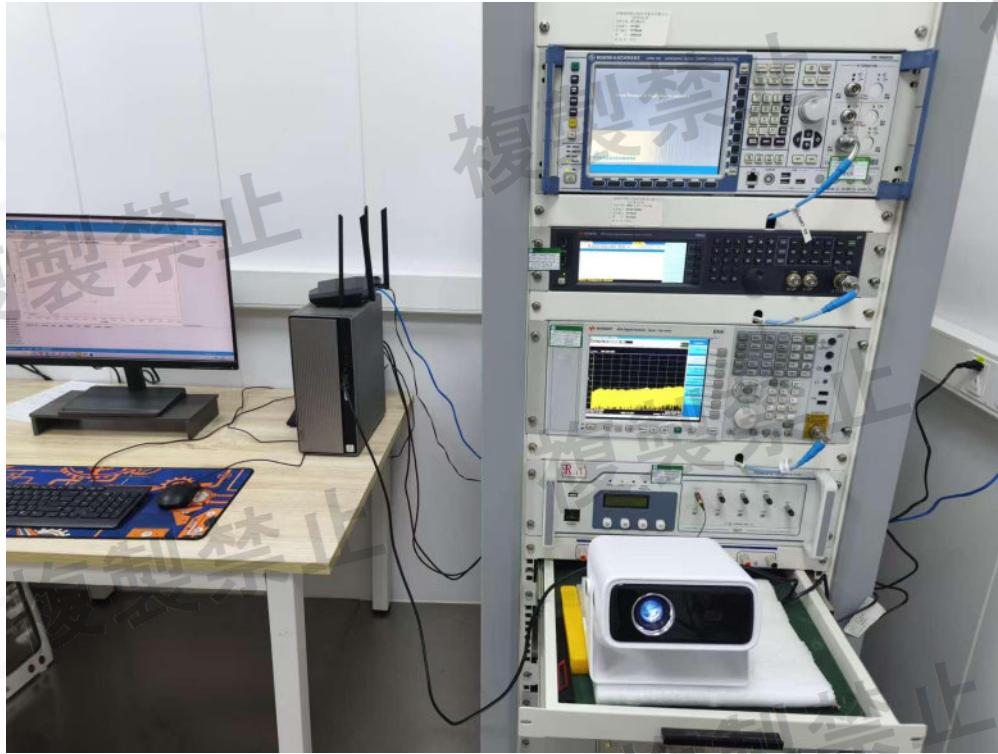
4.10.2. CONFIRMATION METHOD

We apply the product for Japan RF certification. The RF Chip is soldered on the PCB; protect anybody to remove it easily.





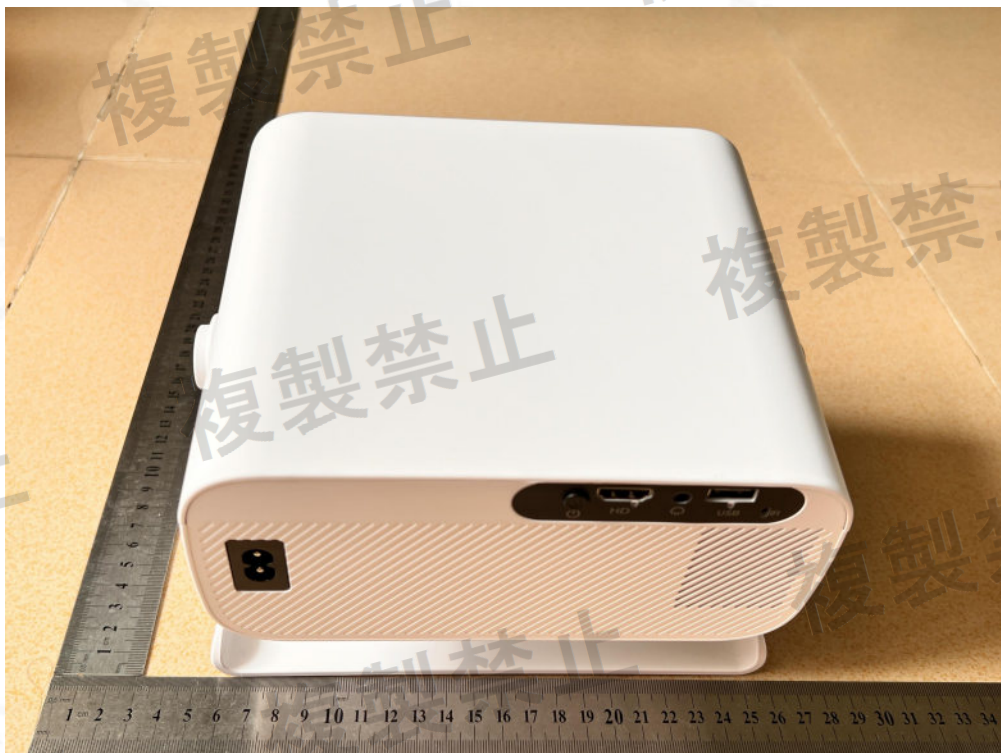
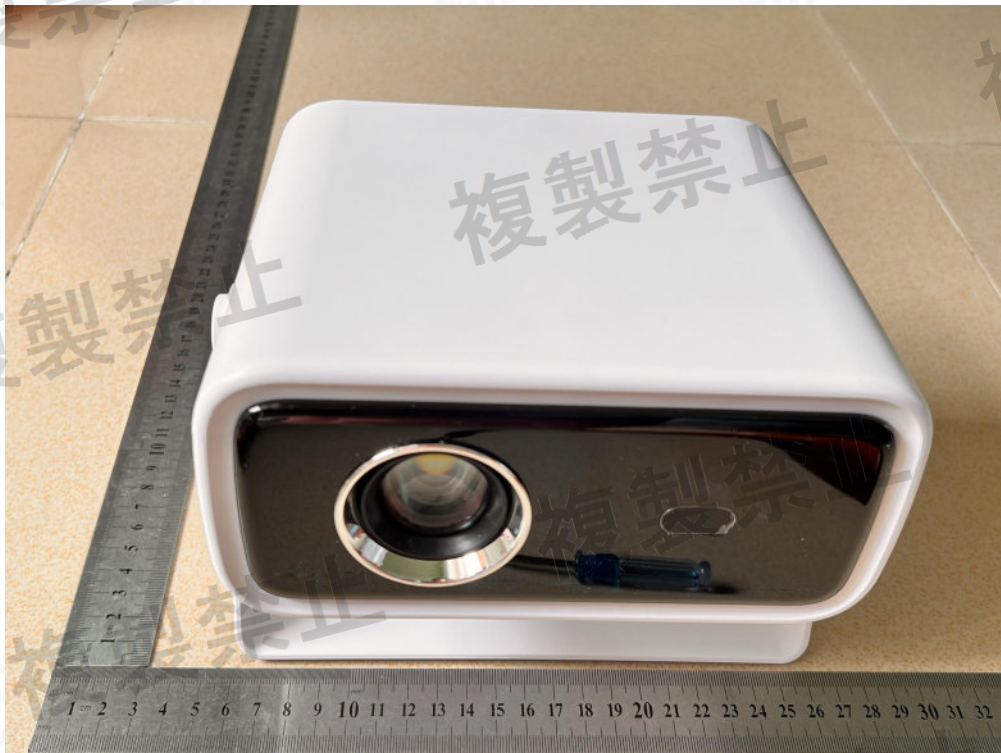
APPENDIX A
PHOTOGRAPHS OF THE TEST SETUP

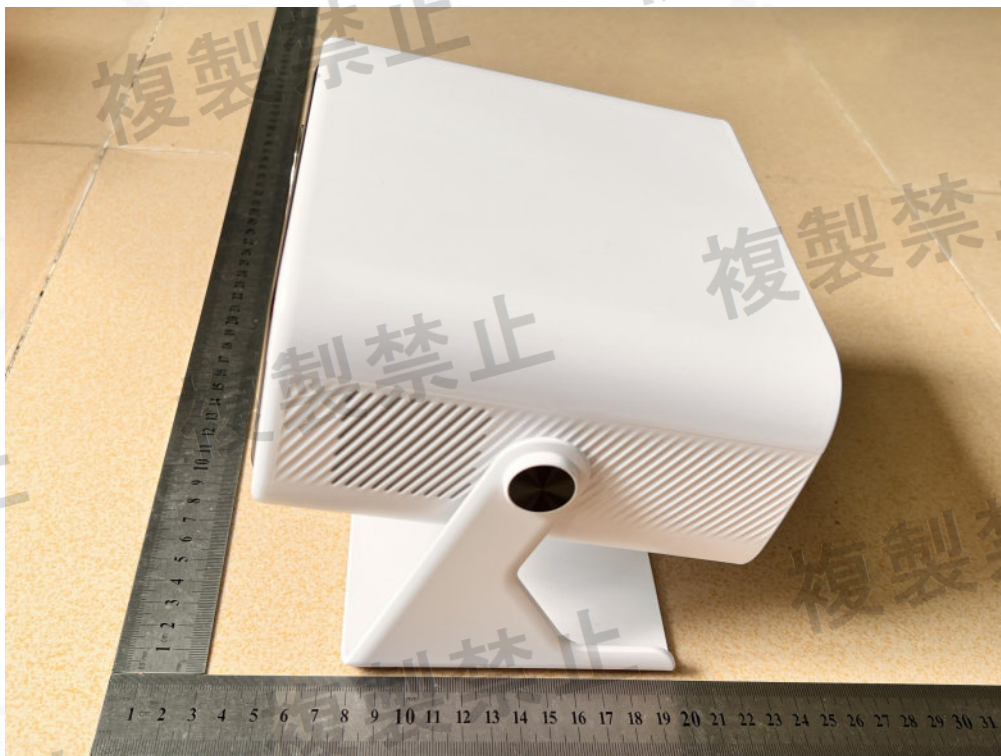
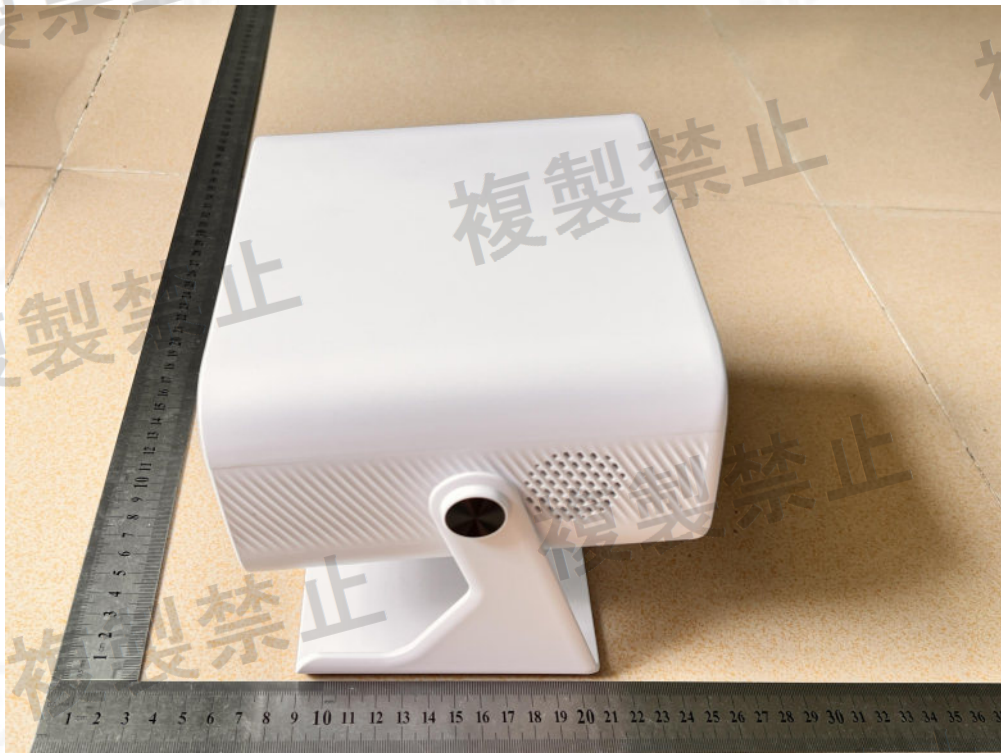




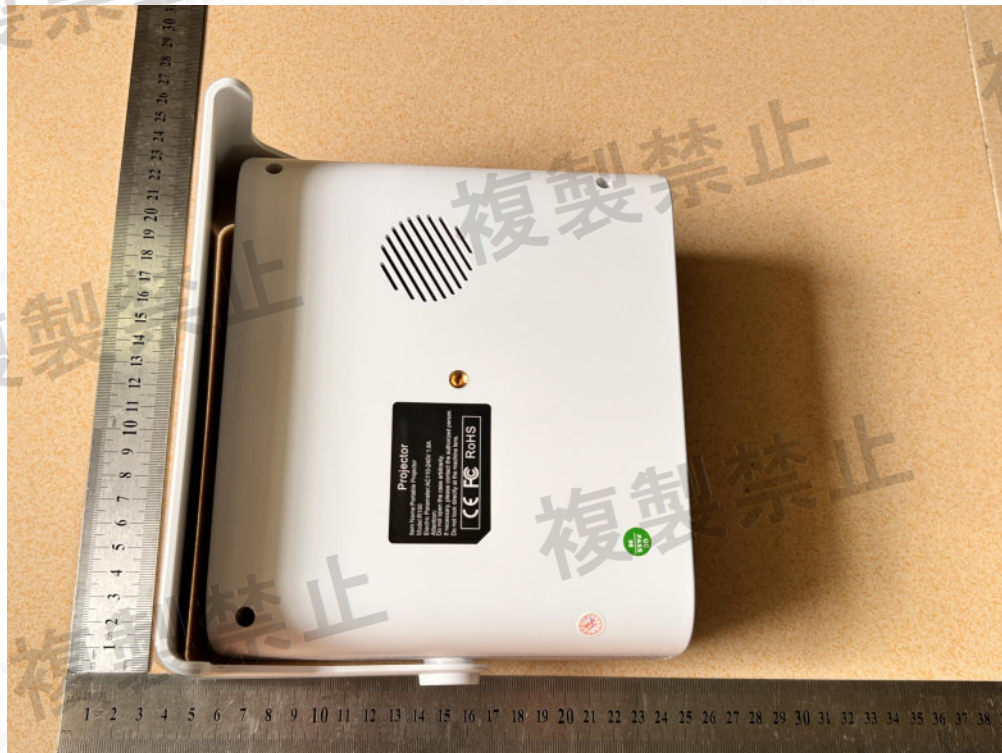
APPENDIX B
PHOTOGRAPHS OF THE EUT

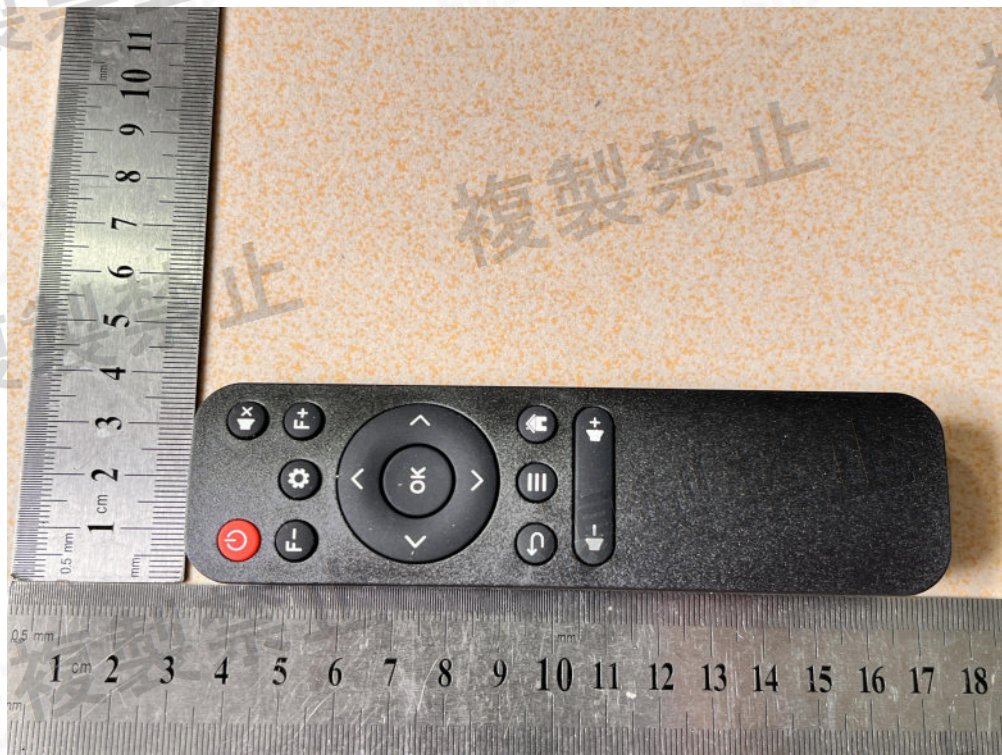


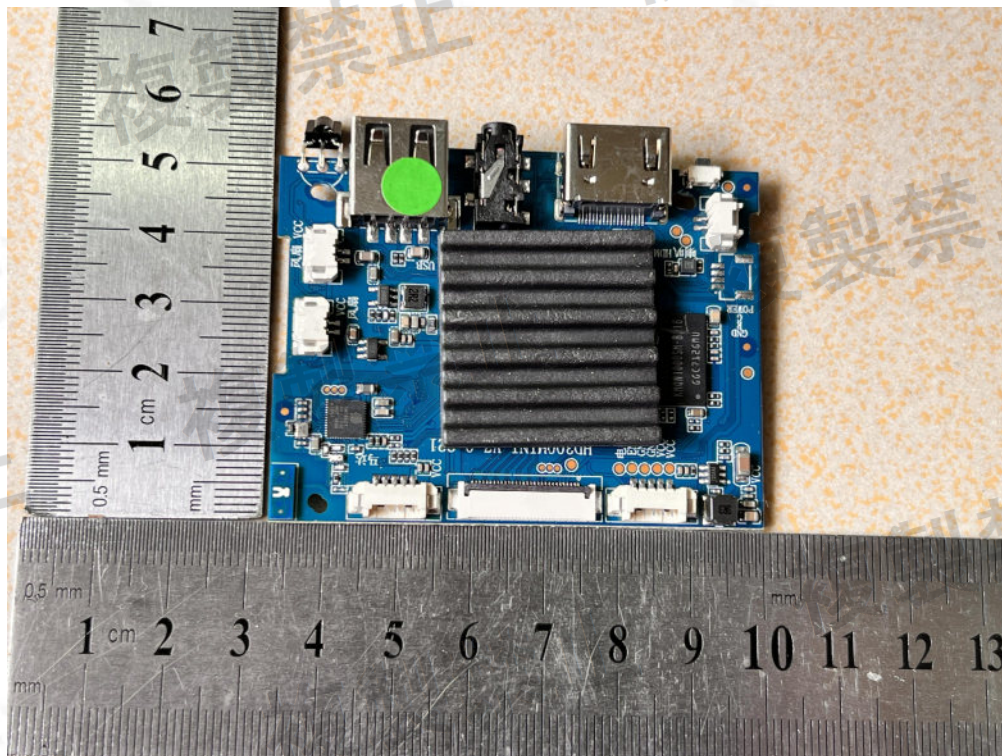
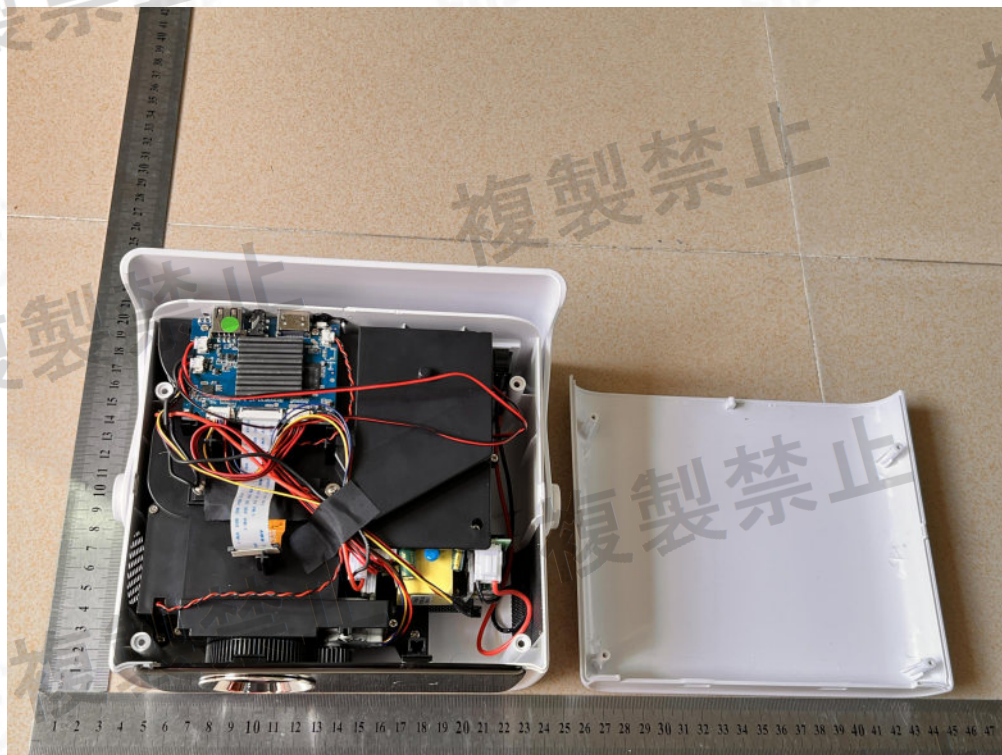


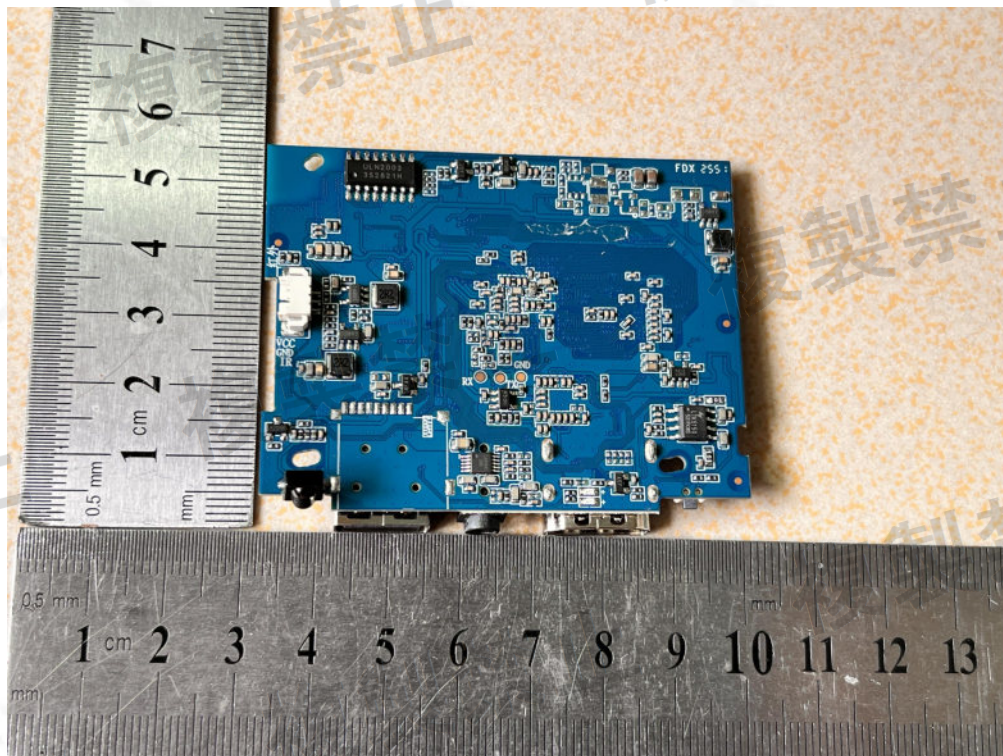
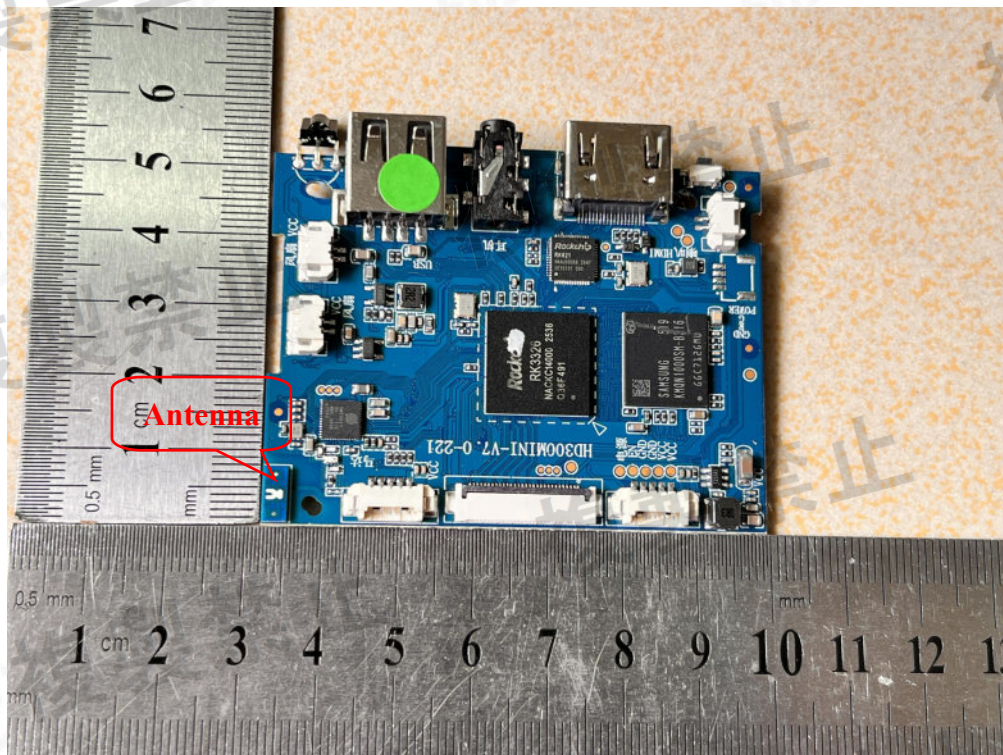


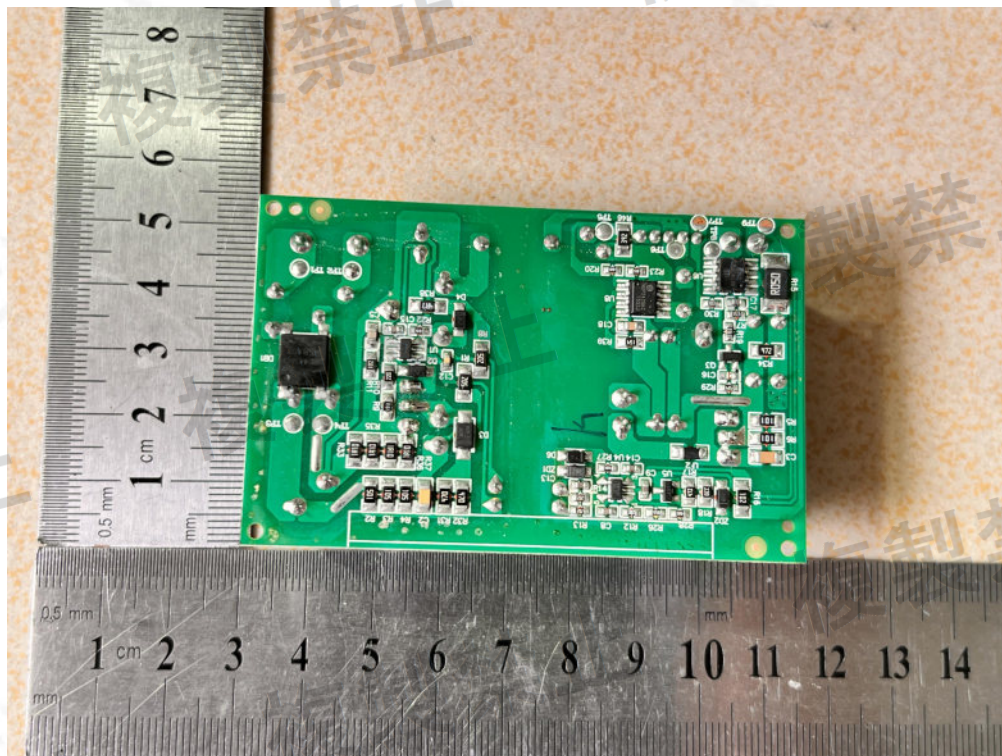
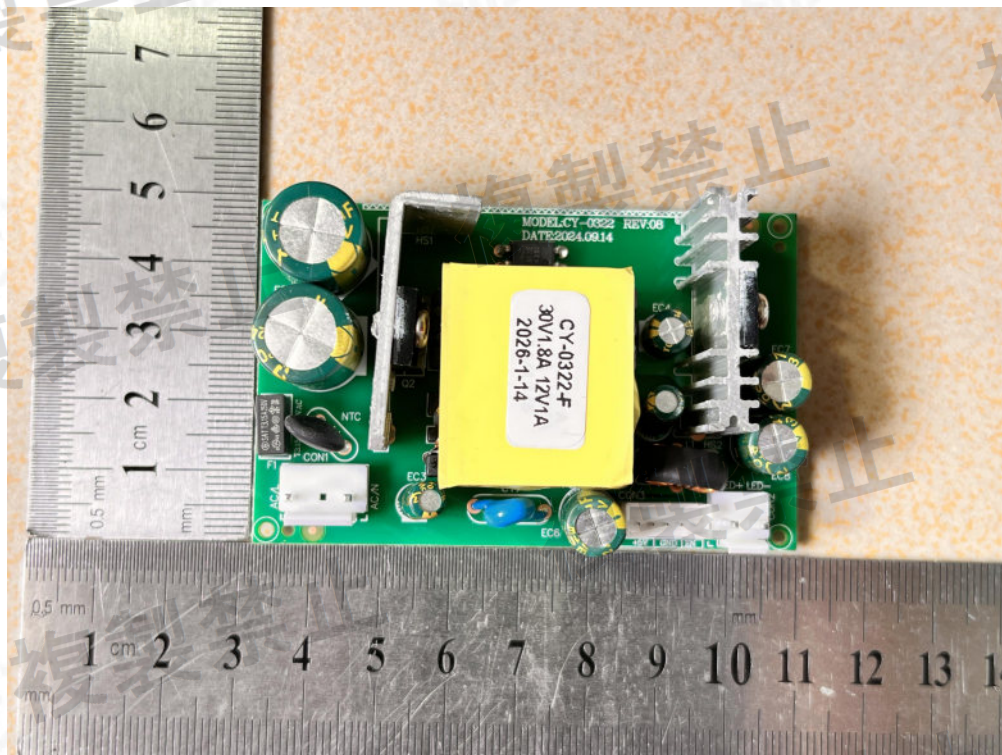












the end of report.